



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

*HAY AND STRAW
MEASURER*

**WEALE'S RUDIMENTARY SCIENTIFIC
AND EDUCATIONAL SERIES.**

The following are the Works already published in

PHYSICAL SCIENCE, &c.

(The Volumes are bound in limp cloth, except where otherwise stated.)

CHEMISTRY, for the Use of Beginners. By Professor GEORGE FOWNES, F.R.S. With an Appendix, on the Application of Chemistry to Agriculture. 1s.

NATURAL PHILOSOPHY, Introduction to the Study of; for the Use of Beginners. By C. TOMLINSON, Lecturer on Natural Science in King's College School, London. Woodcuts. 1s. 6d.

MINERALOGY, Rudiments of; a concise View of the Properties of Minerals. By A. RAMSAY, Jun. Woodcuts and Steel Plates. 3s.; cloth boards, 3s. 6d.

MECHANICS, Rudimentary Treatise on; being a concise Exposition of the General Principles of Mechanical Science, and their Applications. By CHARLES TOMLINSON. Illustrated. 1s. 6d.

ELECTRICITY: showing the General Principles of Electrical Science, and the purposes to which it has been applied. By Sir W. SNOW HARRIS, F.R.S., &c. With considerable Additions by R. SABINE, C.E., F.S.A. Woodcuts. 1s. 6d.

GALVANISM, Rudimentary Treatise on, and the General Principles of Animal and Voltaic Electricity. By Sir W. SNOW HARRIS. New Edition, revised, with considerable Additions, by ROBERT SABINE, C.E., F.S.A. Woodcuts. 1s. 6d.

MAGNETISM: being a concise Exposition of the General Principles of Magnetical Science, and the Purposes to which it has been applied. By Sir W. SNOW HARRIS. New Edition, revised and enlarged by H. M. NOAD, Ph.D. With 165 Woodcuts. 3s. 6d.; cloth boards, 4s.

THE ELECTRIC TELEGRAPH: its History and Progress. With Descriptions of some of the Apparatus. By R. SABINE, C.E., F.S.A., &c. Woodcuts. 3s.

PNEUMATICS, for the Use of Beginners. By CHARLES Tomlinson. Illustrated. 1s. 6d.

A SELECTION FROM WEALE'S SERIES.

ASTRONOMY. By the Rev. R. MAIN, M.A., F.R.S., &c. New Edition, with an Appendix on "Spectrum Analysis." Woodcuts. 1s. 6d.

STATICS AND DYNAMICS, the Principles and Practice of; embracing also a clear development of Hydrostatics, Hydrodynamics, and Central Forces. By T. BAKER, C.E. 1s. 6d.

TELEGRAPH, Handbook of the; a Manual of Telegraphy, Telegraph Clerks' Remembrancer, and Guide to Candidates for Employment in the Telegraph Service. By R. BOND. Fourth Edition, revised and enlarged: to which is appended, QUESTIONS on MAGNETISM, ELECTRICITY, and PRACTICAL TELEGRAPHY, for the Use of Students, by W. MCGREGOR. Woodcuts. 3s.; cloth boards, 3s. 6d.

COAL AND COAL MINING: a Rudimentary Treatise on. By WARINGTON W. SMYTH, M.A., F.R.S., &c., Chief Inspector of the Mines of the Crown and of the Duchy of Cornwall. New Edition, revised and corrected. With numerous Illustrations. 3s. 6d.; cloth boards, 4s.

PHYSICAL GEOLOGY, partly based on Major-General PORTLOCK's "Rudiments of Geology." By RALPH TATE, A.L.S., &c. Woodcuts. 2s.

HISTORICAL GEOLOGY, partly based on Major-General PORTLOCK's "Rudiments." By RALPH TATE, A.L.S., &c. Woodcuts. 2s. 6d.

* * *Physical and Historical Geology bound in one Volume, cloth limp, 4s. 6d., or cloth boards, 5s.*

ANIMAL PHYSICS, Handbook of. By Dr. LARDNER, D.C.L. With 520 Illustrations. In One Vol. 7s. 6d., cloth boards.

* * *Sold also in Two Parts, as follows:—*

Part I., Chapters I.—VII. 4s.

Part II., Chapters VIII.—XVIII. 3s.

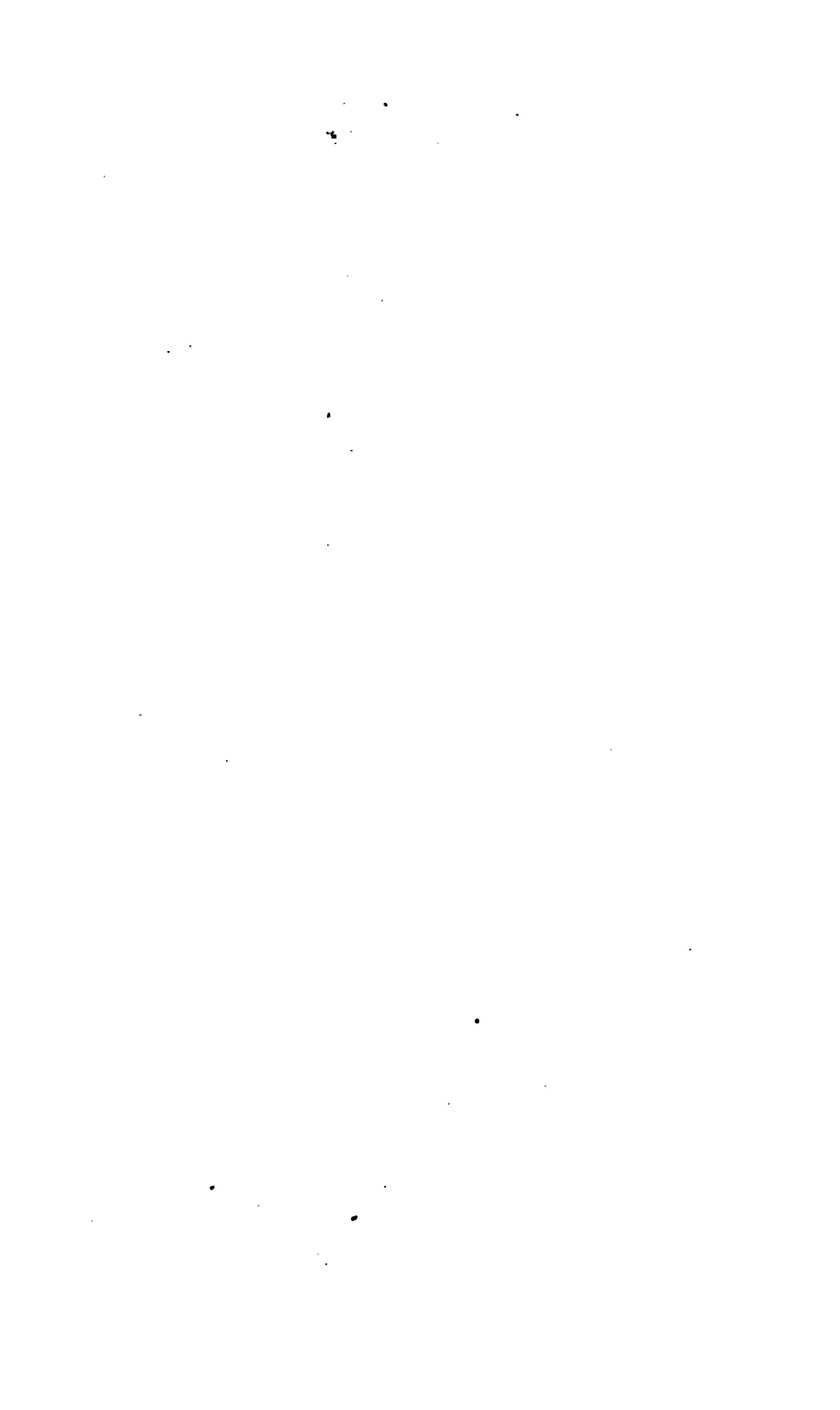
METALLURGY OF COPPER: an Introduction to the Methods of Seeking, Mining, and Assaying Copper, and Manufacturing its Alloys. By ROBERT H. LAMBORN, Ph.D. Woodcuts 2s. 6d.; cloth boards, 3s.

METALLURGY OF SILVER AND LEAD. A Description of the Ores; their Assay and Treatment, and valuable Constituents. By Dr. R. H. LAMBORN. Woodcuts. 2s. 6d. cloth boards, 3s.

ELECTRO-METALLURGY, Practically Treated. By ALEXANDER WATT, F.R.S.S.A. Seventh Edition, revised, with important additions, including the Electro-deposition of Nickel &c. &c. Woodcuts. 3s.; cloth boards, 3s. 6d.

METALLURGY OF IRON, a Treatise on the. Containing History of Iron Manufacture, Methods of Assay, and Analyses of Iron Ores, Processes of Manufacture of Iron and Steel, &c. By H. BAUERMAN, F.G.S. Fourth Edition, enlarged with numerous Illustrations. 4s. 6d.; cloth boards, 5s.

CROSBY LOCKWOOD & CO., 7, STATIONERS' HALL COURT, F



THE HAY AND STRAW MEASURER:

BEING

NEW TABLES FOR THE USE OF AUCTIONEERS,
VALUERS, LAND SURVEYORS, FARMERS,
HAY AND STRAW DEALERS, ETC.

SHOWING

HOW TO ASCERTAIN THE CUBICAL CONTENTS IN ~~FEET~~ AND WEIGHT, IN
ROUND OR OBLONG STACKS;
THE MEASUREMENT OF TIMBER;
PARALLELOGRAMS FOR LAND MEASURE; THE NUMBER OF LINKS IN
A SQUARE OF ANY NUMBER OF ACRES OF LAND;
THE WEIGHT OF COPPERS, 1 TO 200 GALLONS;
CIRCUMFERENCE OF CIRCLES,
ETC.

FORMING

A Complete Calculator and Ready-Reckoner
ESPECIALLY ADAPTED FOR PERSONS CONNECTED WITH AGRICULTURE.

By JOHN STEELE,
CHELMSFORD, ESSEX.

FOURTH EDITION, ENLARGED



LONDON:
CROSBY LOCKWOOD AND CO.,
7, STATIONERS' HALL COURT, LUDGATE HILL.
1882.

181. 9. 201.



PREFACE.

In presenting the following Tables to the notice of Auctioneers, Valuers, Hay and Straw Dealers, Farmers, and others, the Author, who has been an extensive grower of hay, as well as a purchaser of vast quantities in stacks of large dimensions, calls especial attention to the simplicity of his plan; affording, as it does, information to sellers and buyers; showing at a glance the means of readily ascertaining by admeasurement—

1. The Circumference of Circles, also the Solid or Cubical Content of Stacks of Hay of Round or Circular form.
2. The solid or Cubical Content of Stacks of Hay or Straw of an Oblong form.
3. The Average Weight of Hay and Straw per cubic foot.
3. To calculate Weight of Straw.
Hay.
4. "Solidity" and Weight of Hay in Trusses per cubic foot.
5. Comparative Weight of Hay in cubic feet or yards to the Ton.
6. Equivalent Weight of Hay by the 'Ton, the Load, or Stone.
Vice versa.
7. Equivalent Weight of Straw by the Ton or Load, or by the Stone. *Vice versa.*
8. Number of Cubic Yards or Cart-loads in Clamps of Manure.
9. Comparative prices from $\frac{1}{4}$ of a penny per lb. upwards.
9. Price of Commodities from $\frac{1}{4}$ of a penny upwards.
10. A Guide to Purchasers or Sellers of Timber.
11. Area, Size, and Quantity of Gallons in Tanks.
12. Number of Gallons in Cubic Feet, Cubic Yards, and French Metres.
13. Area and Circumference of Circles.
14. Ready Reckoner.
15. Weight of Produce per acre.
16. The Cubical Contents of Drains or Ditches.
17. Land Measure (Parallelogram).
18. Number of Links in side of a Square.
19. The Weight of Coppers, 1 to 200 gallons.
20. To calculate by Feet, Yards, Rods, or French Metres.
21. Calving and Lambing Table.
22. The Planting Table.
23. Tables of Measurement.

The whole forming a complete Ready-reckoner for the use of Auctioneers, Valuers, Land Surveyors, Farmers, Bailiffs, Hay and Straw Dealers, &c.

Several of the Tables were in the first instance drawn out for the author's private use, for readily ascertaining by admeasurement the solid or cubical contents and weight in stacks of hay, straw, &c., either in round, square, or oblong forms.

Great care has been taken in compiling them to insure accuracy, also in making their application for practical purposes easy to be understood.

Examples are frequently given in these pages which will greatly assist all who have occasion to use the work.

Explanations are given for measuring the length, breadth, and height of stacks; and on referring to the Tables the total contents and weight will be ascertained.

PREFACE TO THE FOURTH EDITION.

THIS work was first published by the Author in the year 1870, and met with the approval of many Agricultural Auctioneers, Valuers, Hay Dealers, &c. The Author was gratified by receiving numerous congratulations and testimonials as to its utility and usefulness.

In this edition several additional and very useful tables have been added (some especially adapted to the requirements of Land Surveyors), which it is hoped will further enhance its value.

On account of the advanced age of the Author the work has been transferred to the present publishers.

CHELMSFORD, *November*, 1881.

CONTENTS.

	PAGE
TABLE I.	
Shows the solid feet, or cubical content, of stacks of a round form, from $7\frac{1}{2}$ to 17 feet in height, and from 12 to 110 feet in circumference	1
TABLE II.	
Shows the solid feet, or cubical content, of stacks of a square or oblong form, measuring from 1 to 50 feet in length, from 11 to 25 feet in breadth, and 3 inches to 18 feet in height . . .	8
TABLE III.	
Shows the cubical content and weight in a stack of hay or straw, from 5 to 12,000 cubic feet, and weighing 4 to $10\frac{1}{2}$ lbs. per cubic foot	40
TABLE IV.	
Shows the depth in inches of a truss of hay 24 inches wide, and 30, 33, and 36 inches long, measuring end of stack and squaring. The solidity and weight per cubic foot . . .	50
TABLE V.	
Shows the comparative or equivalent weight of hay in pounds per cubic foot, or pounds per cubic yard; also in stones of 14 lbs. per cubic yard; also the number of cubic feet to the hundred-weight; also the number of cubic feet or cubic yards to the ton . . .	51
TABLE VI.	
Shows the relative or equivalent weight of hay in tons of 20 cwt., or in loads weighing 18 cwt., or in stones of 14 lbs. Also, loads are converted into tons, or stones of 14 lbs. . .	52
TABLE VII.	
Shows the relative or equivalent weight of straw in tons of 20 cwt., or in loads weighing 11 cwt. 2 qrs. 8 lbs., or in stones of 14 lbs. Also, by the load, in tons, or stones . . .	53
TABLE VIII.	
Shows the number of cubic yards, or cart-loads containing 30, 35, 40, 45, and 50 cubic feet, in a clamp of manure of any given size, from 25 to 12,000 cubic feet	54
TABLE IX.	
Shows the price of any commodity, either by the stone of 8 lbs., by the stone of 14 lbs., by the score of 20 lbs., by the cwt. of 112 lbs., or by the ton of 20 cwt., from $\frac{1}{8}$ of a penny per pound upwards	55
TABLE X.	
Shows how to find the solidity or content of round or unsquared timber	57

	PAGE
TABLE XI.	
Shows the area and number of imperial gallons contained in square or rectangular tanks of various sizes, 12 inches deep . . .	58
TABLE XII.	
Shows the number of imperial gallons contained in tanks or reservoirs of a circular, square, or oblong form; the content or capacity being given either in cubic feet, cubic yards, or French cubic metres, from $\frac{1}{4}$ foot to 270,000 cubic feet . . .	60
TABLE XIII.	
Shows the relative areas and circumferences of circles of a given diameter	63
TABLE XIV.	
Shows the comparative or relative amount of income, or workmen's wages, either by the day, the week, the lunar month, the calendar month, or the year	65
TABLE XV.	
Shows the weight of any substance produced upon an acre of land, calculated from a $\frac{1}{4}$ lb. to 28 lbs. per square yard	66
TABLE XVI.	
Shows the cubical contents of each rod ($16\frac{1}{2}$ feet in length) in drains or ditches of various dimensions	67
TABLE XVII.	
Showing the several lengths and breadths which are equal to an acre of land, advancing by links	68
TABLE XVIII.	
Shows the number of links in the side of a square of any number of acres of land, advancing by quarters at a time to 28 acres, and thence by half-acres to 100	73
TABLE XIX.	
Shows the weight in lbs. of coppers, from 1 to 220 gallons; the dimensions taken from lag to brim	74
TABLE XX.	
Calving Table	75
TABLE XXI.	
Lambing Table	75
TABLE XXII.	
Showing the number of Plants required to plant an acre of land at the several required distances	76

TABLES OF MEASUREMENT	78

NEW TABLES

FOR

AGRICULTURAL CALCULATIONS.

TABLE I.

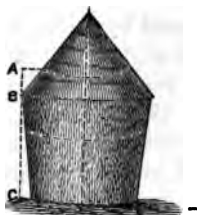
HAY AND STRAW MEASURER, ETC.

SHOWS THE SOLID FEET, OR CUBICAL CONTENT, OF STACKS
OF A ROUND OR CIRCULAR FORM, MEASURING FROM $7\frac{1}{2}$
TO 17 FEET IN HEIGHT, AND FROM 12 TO 110 FEET IN
CIRCUMFERENCE.

The girths are placed in the first or left-hand columns, the heights for every half-foot will be observed along the top of the other columns. The content is found opposite the given girth, and in the column under the given height.

To find the cubical content of a stack of hay of a round form, such as the accompanying figure:—As the roof of a round stack is of a conical shape, you must only reckon and measure a third part from the top to the eaves, following on to the bottom.

Example 1.—Suppose the roof of a round stack to measure



6 feet from the top to the eaves, you will only reckon a third part, as A to B, say 2 feet, as the case may be, and

from the eaves to the bottom, as B to C, say $9\frac{1}{2}$ feet, this will give the mean height to be $11\frac{1}{2}$ feet; then at half the mean height measure the circumference—say 83 feet.

See p. 7. In the first or left hand column will be found the girth, or circumference, 83 feet; opposite and in the line and under the height, $11\frac{1}{2}$ feet, stands 6805 feet, the cubic content required.

Having ascertained the cubical content in feet, you must, of course, use a little of your own judgment as to the stack being loose or solid. Should it have been set up three months, and not settled down very close, it may only weigh, say 7 lbs. per cubic foot.

See Table III., Weight of Hay, p. 42.

NOTE.—As stated in the explanatory remarks on Table III., the weight of hay in stacks, &c., per cubic foot, varies much from size, age, and solidity. Tables I. and II. show the cubical contents in solid feet of round, square, or oblong stacks; and Table III. shows the number of tons, trusses, and lbs. weight in any given number of cubic feet, ranging from 4 to $10\frac{1}{4}$ lbs. per cubic foot.

If a stack be larger round at the eaves than at the bottom you must take your measurement between the two for the mean girth.

If any height be required which is not in these pages, it can be found by taking half the content of one of the heights, or by adding together the contents of two of the heights.

Should any required girth exceed the bounds of this table, the content may be found by taking half of the given girth in the table, and multiplying its content by 4, the product will be the content of the girth required. Thus, to find the content of a stack of 126 feet girth, and $16\frac{1}{2}$ feet high, see Table at p. 7. In the left hand column we find half its girth, 63 feet, opposite and in the column under the height of $16\frac{1}{2}$ feet stands 5211 feet, which multiplied by 4 will give 20844 cubic feet, which if divided by 27 (the number of cubic feet in a yard) will give 772 cubic yards.

To find the cubical content by the pen, multiply the girth by itself, and the product by the mean height, and this product by the decimal $\cdot 0029474$, it will give $233\cdot 5033439$; if you point off as many places of figures from the right as there are decimal places in the multiplier, the figures to the left of the point will show the solid content in yards, and those to the right are decimal parts of a yard; after which multiply by 27 (the number of feet in a cubic yard), the product will be $6304\cdot 5902853$. With the same number of figures pointed off, those to the left of the point are solid feet, and those to the right are decimal parts of a foot, as follows:—

$$83 \times 83 = 6889 \times 11\frac{1}{2} = 79223\frac{1}{2} \times \cdot 0029474 = \begin{array}{r} 233\cdot 5033439 \\ 9 \\ \hline 4 \\ 2101\cdot 5300931 \\ 3 \\ \hline 18 \\ 6304\cdot 5902853 \end{array}$$

Showing the solid content to be $233\frac{1}{2}$
yards and a fraction, or the content in
cubic feet

NOTE.—Decimal parts of half a foot or more are reckoned as 1, and those under half a foot are neglected.

The multiplier, $\cdot 0029474$, is found by dividing $\cdot 07958$, the area of a circle whose circumference is 1, by 27, the number of cubic feet in a yard.

TABLE I.
CUBIC CONTENTS OF ROUND STACKS.

Girth.	Height.									
	7½ ft.	8 ft.	8½ ft.	9 ft.	9½ ft.	10 ft.	10½ ft.	11 ft.	11½ ft.	12 ft.
12	86	91	97	103	109	114	120	126	132	138
13	101	108	114	121	128	134	141	148	155	161
14	117	125	133	140	147	155	164	172	179	187
15	134	143	152	161	170	179	188	197	206	215
16	153	163	173	183	194	204	214	224	234	244
17	172	184	195	207	218	230	241	253	264	276
18	193	206	219	232	245	258	271	284	297	310
19	215	230	244	259	275	287	302	316	330	345
20	239	255	271	286	302	318	334	350	366	382
21	264	281	298	316	333	351	368	386	404	421
22	289	308	328	347	366	385	405	426	443	462
23	316	337	358	379	400	421	442	463	484	505
24	344	367	390	413	436	458	481	504	527	550
25	373	398	423	448	473	498	522	547	572	597
26	403	430	457	484	511	538	565	592	619	646
27	435	464	493	522	551	580	609	638	667	696
28	468	499	530	562	593	623	655	686	717	749
29	502	535	569	602	636	669	703	736	770	803
30	537	573	609	645	680	716	752	788	824	859
31	574	612	650	688	727	765	803	841	879	918
32	611	652	693	733	774	815	856	896	937	978
33	650	693	737	780	823	867	910	953	997	1040
34	690	736	782	828	874	920	966	1012	1058	1104
35	731	780	828	877	926	975	1023	1072	1121	1170
36	773	825	877	928	980	1031	1082	1134	1186	1238
37	817	872	926	980	1035	1089	1144	1198	1253	1307
38	862	919	977	1034	1092	1149	1207	1264	1322	1379
39	908	968	1029	1089	1160	1210	1271	1331	1392	1452
40	955	1019	1082	1146	1210	1273	1337	1401	1464	1528
41	1003	1070	1137	1204	1270	1338	1405	1471	1538	1605
42	1053	1123	1193	1263	1334	1404	1474	1544	1614	1685
43	1104	1177	1251	1324	1398	1471	1545	1619	1692	1766
44	1155	1233	1310	1387	1464	1541	1618	1695	1772	1849
45	1209	1289	1370	1450	1531	1612	1692	1773	1853	1934
46	1263	1347	1431	1556	1600	1684	1768	1852	1937	2021
47	1318	1406	1494	1582	1670	1758	1846	1934	2022	2110
48	1375	1467	1558	1650	1742	1833	1925	2017	2109	2200
49	1433	1528	1624	1719	1815	1910	2006	2101	2197	2292
50	1492	1592	1691	1791	1891	1989	2089	2188	2288	2387
51	1552	1656	1769	1863	1966	2070	2173	2277	2380	2484
52	1614	1721	1829	1937	2044	2152	2259	2367	2474	2582
53	1677	1788	1900	2012	2124	2235	2347	2459	2571	2684
54	1740	1856	1972	2088	2205	2321	2437	2553	2669	2785
55	1805	1926	2046	2167	2287	2407	2528	2648	2768	2889
56	1872	1996	2121	2246	2371	2496	2620	2745	2870	2995
57	1939	2068	2198	2327	2456	2586	2715	2844	2973	3103
58	2008	2142	2276	2409	2543	2677	2811	2945	3079	3212
59	2078	2216	2355	2493	2632	2770	2909	3047	3186	3324
60	2149	2292	2435	2578	2722	2865	3008	3151	3295	3438

TABLE I. *continued.*
CUBIC CONTENTS OF ROUND STACKS.

Diameter.	Height.									
	12½ ft.	13 ft.	13½ ft.	14 ft.	14½ ft.	15 ft.	15½ ft.	16 ft.	16½ ft.	17 ft.
12	143	149	153	160	166	171	177	183	189	194
13	168	175	182	188	195	202	208	215	222	229
14	195	203	211	218	226	234	242	250	257	265
15	224	233	242	251	260	269	277	286	295	304
16	255	265	275	285	295	306	316	326	336	346
17	287	299	310	322	333	345	355	368	378	391
18	323	335	348	361	374	387	400	413	426	438
19	359	373	388	402	417	431	445	460	474	488
20	398	414	430	446	462	477	493	509	525	541
21	439	456	474	491	509	526	544	562	579	597
22	482	501	520	540	559	578	597	616	636	655
23	526	547	568	589	610	631	653	676	695	716
24	573	596	619	642	665	688	711	734	756	779
25	622	647	671	699	721	746	771	796	821	846
26	672	699	729	753	780	807	834	861	888	915
27	725	754	783	812	841	870	899	928	957	986
28	780	811	842	873	905	936	967	998	1029	1061
29	837	870	904	937	970	1004	1037	1071	1104	1138
30	895	931	967	1023	1039	1074	1110	1146	1182	1218
31	956	994	1032	1071	1109	1147	1185	1224	1262	1300
32	1019	1059	1100	1141	1182	1222	1263	1304	1345	1385
33	1083	1127	1170	1213	1257	1300	1343	1386	1430	1473
34	1150	1196	1242	1288	1334	1380	1425	1471	1517	1563
35	1218	1267	1316	1365	1413	1462	1511	1560	1608	1657
36	1290	1341	1392	1444	1496	1547	1599	1650	1702	1753
37	1362	1416	1471	1525	1580	1634	1689	1743	1798	1852
38	1436	1494	1551	1609	1666	1724	1781	1839	1896	1954
39	1513	1574	1634	1695	1755	1816	1876	1937	1997	2058
40	1592	1655	1719	1783	1846	1910	1974	2037	2101	2165
41	1672	1739	1806	1873	1940	2007	2073	2140	2207	2274
42	1755	1825	1895	1965	2035	2106	2176	2246	2316	2386
43	1839	1913	1984	2060	2134	2207	2281	2354	2428	2501
44	1926	2003	2080	2158	2234	2311	2388	2465	2542	2619
45	2014	2095	2176	2256	2337	2417	2498	2578	2659	2740
46	2105	2189	2273	2358	2442	2526	2610	2694	2779	2863
47	2197	2285	2373	2461	2549	2637	2725	2813	2901	2988
48	2292	2384	2475	2567	2659	2750	2841	2934	3025	3117
49	2388	2483	2579	2674	2770	2865	2961	3057	3152	3248
50	2487	2586	2686	2785	2885	2984	3084	3183	3283	3382
51	2587	2691	2794	2898	3001	3105	3208	3312	3415	3519
52	2699	2797	2905	3012	3120	3228	3335	3443	3550	3658
53	2794	2906	3018	3130	3241	3353	3465	3577	3688	3800
54	2901	3017	3133	3249	3365	3481	3597	3713	3829	3945
55	3009	3129	3250	3370	3491	3611	3731	3852	3972	4092
56	3120	3244	3369	3494	3619	3743	3868	3993	4118	4243
57	3232	3361	3490	3620	3749	3878	4008	4137	4266	4395
58	3346	3480	3614	3748	3882	4016	4149	4283	4417	4551
59	3463	3601	3740	3878	4017	4155	4294	4432	4571	4709
60	3581	3724	3868	4011	4154	4297	4441	4584	4727	4870

TABLE I. *continued.*
CUBIC CONTENTS OF ROUND STACKS.

Girth.	Height.									
	7½ ft.	8 ft.	8½ ft.	9 ft.	9½ ft.	10 ft.	10½ ft.	11 ft.	11½ ft.	12 ft.
61	2221	2369	2517	2665	2813	2961	3109	3257	3405	3553
62	2264	2247	2600	2753	2906	3059	3213	3365	3518	3671
63	2369	2527	2685	2843	3001	3159	3316	3474	3632	3790
64	2445	2608	2771	2934	3097	3260	3423	3586	3749	3912
65	2522	2690	2858	3026	3194	3362	3530	3698	3867	4035
66	2600	2773	2947	3120	3293	3466	3640	3813	3986	4160
67	2679	2858	3036	3215	3394	3572	3751	3930	4108	4287
68	2760	2944	3128	3312	3496	3680	3864	4048	4232	4416
69	2842	3031	3220	3410	3599	3789	3978	4168	4357	4547
70	2925	3120	3315	3509	3704	3899	4094	4289	4484	4679
71	3009	3209	3410	3610	3811	4012	4212	4413	4613	4814
72	3083	3288	3494	3699	3905	4110	4316	4521	4727	4932
73	3181	3393	3505	3817	4029	4241	4453	4665	4877	5089
74	3268	3486	3704	3922	4140	4358	4576	4794	5011	5229
75	3357	3581	3805	4029	4253	4476	4700	4924	5148	5372
76	3447	3677	3907	4137	4367	4597	4826	5056	5286	5516
77	3539	3775	4011	4246	4482	4718	4954	5190	5426	5662
78	3621	3873	4115	4357	4600	4842	5084	5326	5568	5810
79	3725	3973	4222	4470	4718	4967	5215	5463	5712	5960
80	3820	4074	4329	4584	4838	5093	5348	5602	5857	6112
81	3916	4177	4438	4699	4960	5221	5482	5743	6004	6265
82	4013	4280	4548	4816	5083	5351	5618	5886	6154	6421
83	4112	4386	4660	4934	5208	5482	5756	6030	6305	6579
84	4211	4492	4773	5054	5334	5615	5896	6177	6457	6738
85	4312	4600	4887	5175	5462	5750	6037	6325	6612	6900
86	4414	4709	5003	5297	5591	5886	6080	6474	6769	6963
87	4518	4819	5180	5421	5722	6023	6325	6626	6927	7228
88	4622	4930	5238	5546	5855	6163	6471	6779	7087	7395
89	4728	5043	5358	5673	5988	6304	6619	6934	7249	7564
90	4834	5157	5479	5801	6124	6446	6768	7091	7413	7735
91	4943	5272	5702	5931	6261	6590	6920	7249	7579	7808
92	5052	5389	5725	6062	6399	6736	7072	7409	7746	8083
93	5162	5506	5850	6195	6539	6883	7227	7571	7915	8269
94	5274	5625	5977	6329	6680	7032	7383	7735	8086	8438
95	5387	5746	6105	6464	6823	7182	7541	7900	8259	8618
96	5501	5867	6234	6601	6967	7334	7701	8067	8434	8801
97	5616	5990	6365	6739	7113	7488	7862	8236	8601	8985
98	5732	6114	6496	6879	7261	7643	8025	8407	8789	9171
99	5850	6240	6630	7020	7410	7800	8190	8580	8970	9360
100	5968	6363	6764	7162	7560	7958	8356	8754	9152	9550
101	6088	6494	6900	7306	7712	8118	8524	8930	9336	9742
102	6210	6624	7038	7452	7866	8279	8693	9107	9521	9935
103	6631	6753	7175	7597	8019	8441	8863	9285	9707	10130
104	6459	6890	7320	7751	8182	8612	9043	9474	9904	10345
105	6580	7019	7458	7896	8335	8774	9212	9651	10090	10528
106	6706	7153	7600	8047	8495	8942	9389	9836	10283	10730
107	6833	7289	7744	8200	8656	9111	9567	10022	10478	10933
108	6962	7426	7890	8354	8818	9282	9746	10210	10675	11139
109	7091	7564	8037	8509	8982	9455	9928	10400	10873	11346
110	7222	7703	8185	8666	9148	9629	10111	10592	11074	11555

TABLE I. *continued.*
CUBIC CONTENTS OF ROUND STACKS.

Girth.	Height.									
	12½ ft.	13 ft.	13½ ft.	14 ft.	14½ ft.	15 ft.	15½ ft.	16 ft.	16½ ft.	17 ft.
61	3701	3850	3998	4146	4294	4442	4590	4738	4886	5034
62	3824	3977	4130	4283	4436	4589	4742	4894	5047	5200
63	3948	4106	4264	4422	4580	4738	4896	5054	5211	5369
64	4074	4237	4400	4563	4726	4889	5052	5215	5378	5541
65	4203	4371	4539	4707	4875	5043	5211	5380	5548	5716
66	4333	4506	4680	4853	5026	5200	5373	5546	5720	5893
67	4465	4644	4823	5001	5180	5359	5537	5716	5894	6073
68	4600	4784	4968	5152	5336	5520	5704	5888	6072	6256
69	4736	4925	5115	5304	5494	5683	5873	6062	6252	6441
70	4874	5069	5264	5459	5654	5849	6044	6239	6434	6629
71	5015	5215	5416	5616	5817	6017	6218	6419	6619	6820
72	5138	5343	5549	5755	5960	6166	6371	6577	6782	6988
73	5301	5513	5725	5937	6149	6361	6573	6785	6997	7209
74	5447	5665	5883	6101	6319	6537	6755	6972	7190	7408
75	5595	5819	6043	6267	6491	6715	6938	7162	7386	7610
76	5746	5975	6205	6435	6665	6895	7125	7354	7584	7814
77	5898	6134	6370	6606	6842	7079	7313	7549	7785	8021
78	6052	6294	6536	6778	7020	7262	7504	7747	7989	8231
79	6208	6457	6705	6953	7202	7450	7698	7947	8195	8443
80	6366	6621	6876	7130	7385	7640	7894	8149	8404	8658
81	6527	6788	7049	7310	7571	7832	8093	8354	8615	8876
82	6689	6956	7224	7491	7759	8026	8294	8562	8829	9097
83	6853	7127	7401	7675	7949	8223	8497	8772	9046	9320
84	7019	7300	7580	7861	8142	8423	8703	8984	9265	9546
85	7187	7475	7762	8049	8337	8624	8912	9199	9487	9774
86	7367	7661	7946	8241	8535	8830	9125	9420	9715	10010
87	7529	7830	8132	8433	8734	9035	9336	9637	9939	10240
88	7703	8011	8320	8628	8936	9244	9552	9868	10168	10477
89	7879	8195	8510	8825	9140	9455	9770	10086	10401	10716
90	8057	8380	8702	9024	9347	9669	9991	10314	10636	10958
91	8238	8567	8896	9226	9556	9885	10215	10544	10874	11203
92	8420	8756	9093	9430	9767	10103	10440	10777	11114	11450
93	8604	8948	9292	9636	9980	10324	10668	11013	11357	11701
94	8790	9141	9493	9844	10196	10548	10899	11251	11602	11954
95	8978	9337	9696	10055	10414	10773	11132	11491	11850	12209
96	9168	9534	9901	10268	10634	11001	11368	11735	12101	12468
97	9360	9734	10108	10483	10857	11231	11606	11980	12355	12729
98	9554	9936	10318	10700	11082	11464	11846	12229	12611	12993
99	9750	10140	10529	10919	11309	11699	12089	12479	12869	13259
100	9947	10345	10743	11141	11539	11937	12335	12733	13131	13528
101	10147	10553	10959	11365	11771	12177	12583	12989	13395	13800
102	10349	10763	11177	11590	12005	12419	12833	13247	13660	14075
103	10552	10974	11396	11818	12240	12662	13084	13506	13928	14350
104	10765	11196	11627	12057	12488	12919	13349	13780	14210	14641
105	10967	11406	11844	12283	12722	13161	13599	14038	14477	14915
106	11177	11624	12071	12518	12965	13412	13859	14307	14754	15201
107	11389	11844	12300	12756	13211	13667	14122	14578	15033	15489
108	11603	12067	12531	12995	13459	13923	14387	14852	15316	15780
109	11819	12291	12764	13237	13710	14182	14655	15128	15601	16073
110	12036	12518	12999	13481	13962	14444	14925	15407	15888	16370

TABLE II.

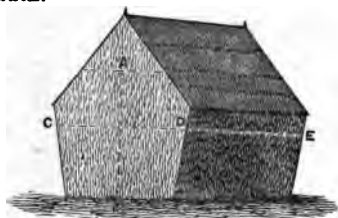
HAY AND STRAW MEASURER, ETC.

SHOWS THE SOLID FEET, OR CUBICAL CONTENT, OF STACKS OF A SQUARE OR OBLONG FORM, MEASURING FROM 1 TO 50 FEET IN LENGTH, FROM 11 TO 25 FEET IN BREADTH, AND 8 INCHES TO 18 FEET IN HEIGHT.

The breadths are found on the top of the several pages, the lengths are placed in the left-hand columns, and the heights are arranged along the tops of the other columns; at any given breadth or height the content is found opposite to any given length, and in the column under the given height.

Should any dimensions exceed the bounds of this table, the cubic content may be found by adding together the contents of two dimensions, either in length, breadth, or height.

To find the solid content of a stack of hay, such as the form adjoining, the ends being perpendicular; but should the breadth be wider at the eaves than at the bottom, add the two measurements together, and divide the sum by 2 for the mean breadth.



Example 1.—At one end of the stack measure the height; that is, to half way between the top and the eaves, and then downwards to the bottom, as A to B, say 10 feet. Secondly,

measure the breadth, as C to D, say 19 feet. Thirdly, measure the length, as D to E, say 25 feet. Now turn to Table II., p. 27, breadth 19 feet: in the first or left-hand column will be found the length 25 feet; opposite and in the column under the height, 10 feet, stands 4750 feet, the cubical content required.

Having ascertained the cubical content in feet, you must, of course, use a little of your own judgment as to the stack being loose or solid. Should it have been set up three months, and not settled down very close, it may only weigh, say $7\frac{1}{4}$ lbs. per cubic foot.

See Table III., Weight of Hay, p. 46.

Example 2.—Suppose a stack of hay to be got up in good order, and settled down more closely than the first, and to weigh, say $8\frac{1}{2}$ lbs. per cubic foot, and to measure from A to B, say 10 feet, from C to D, say 22 feet, and from D to E, say 29 feet. Turn to Table II., p. 32, breadth 22 feet: in the first or left-hand column we find the length 29 feet; opposite which, and in the column under the height of 10 feet, stands 6380 feet, the cubic content.

See Table III., Weight of Hay, p. 47.

To find the cubic content by the pen, multiply the breadth by the height, and the product by the length. Thus, $22 \times 10 = 220 \times 29 = 6380$ cubic feet, which, if you divide by 27 (the number of feet in a cubic yard), the product will be 236 yards 8 feet.

By this cubic table the content of any building, clamps of bricks, stone, road materials, earthwork, excavations, stacks of bark, hay, straw, &c., can be ascertained in cubic feet.

TABLE II.
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 11 feet.

Length.	Height.									
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	2 $\frac{1}{4}$	5 $\frac{1}{2}$	11	22	33	44	55	66	77	88
2	5 $\frac{1}{2}$	11	22	44	66	88	110	132	154	176
3	8 $\frac{1}{4}$	16 $\frac{1}{2}$	33	66	99	132	165	198	231	264
4	11	22	44	88	132	176	220	264	308	352
5	13 $\frac{1}{4}$	27 $\frac{1}{2}$	55	110	165	220	275	330	385	440
6	16 $\frac{1}{2}$	33	66	132	198	264	330	396	462	528
7	19 $\frac{1}{4}$	38 $\frac{1}{2}$	77	154	231	308	385	462	539	616
8	22	44	88	176	264	352	440	528	616	704
9	24 $\frac{1}{4}$	49 $\frac{1}{2}$	99	198	297	396	495	594	693	792
10	27 $\frac{1}{4}$	55	110	220	330	440	550	660	770	880
11	30 $\frac{1}{4}$	60 $\frac{1}{2}$	121	242	363	484	605	726	847	968
12	33	66	132	264	396	528	660	792	924	1056
13	35 $\frac{1}{4}$	71 $\frac{1}{2}$	143	286	429	572	715	858	1001	1144
14	38 $\frac{1}{2}$	77	154	308	462	616	770	924	1078	1232
15	41 $\frac{1}{4}$	82 $\frac{1}{2}$	165	330	495	660	825	990	1155	1320
16	44	88	176	352	528	704	880	1056	1232	1408
17	46 $\frac{1}{2}$	93 $\frac{1}{2}$	187	374	561	748	935	1122	1309	1496
18	49 $\frac{1}{4}$	99	198	396	594	792	990	1188	1386	1584
19	52 $\frac{1}{4}$	104 $\frac{1}{2}$	209	418	627	836	1045	1254	1463	1672
20	55	110	220	440	660	880	1100	1320	1540	1760
21	57 $\frac{1}{2}$	115 $\frac{1}{2}$	231	462	693	924	1155	1386	1617	1848
22	60 $\frac{1}{4}$	121	242	484	726	968	1210	1452	1694	1936
23	63 $\frac{1}{4}$	126 $\frac{1}{2}$	253	506	759	1012	1265	1518	1771	2024
24	66	132	264	528	792	1056	1320	1584	1848	2112
25	68 $\frac{1}{2}$	137 $\frac{1}{2}$	275	550	825	1100	1375	1650	1925	2200
26	71 $\frac{1}{4}$	143	286	572	858	1144	1430	1716	2002	2288
27	74 $\frac{1}{4}$	148 $\frac{1}{2}$	297	594	891	1188	1485	1782	2079	2376
28	77	154	308	616	924	1232	1540	1848	2156	2464
29	79 $\frac{1}{2}$	159 $\frac{1}{2}$	319	638	957	1276	1595	1914	2233	2552
30	82 $\frac{1}{4}$	165	330	660	990	1320	1650	1980	2310	2640
31	85 $\frac{1}{4}$	170 $\frac{1}{2}$	341	682	1023	1364	1705	2046	2387	2728
32	88	176	352	704	1056	1408	1760	2112	2464	2816
33	90 $\frac{1}{2}$	181 $\frac{1}{2}$	363	726	1089	1452	1815	2178	2541	2904
34	93 $\frac{1}{4}$	187	374	748	1122	1496	1870	2244	2618	2992
35	96 $\frac{1}{4}$	192 $\frac{1}{2}$	385	770	1155	1540	1925	2310	2695	3080
36	99	198	396	792	1188	1584	1980	2376	2772	3168
37	101 $\frac{1}{2}$	203 $\frac{1}{2}$	407	814	1221	1628	2035	2442	2849	3256
38	104 $\frac{1}{4}$	209	418	836	1254	1672	2090	2508	2926	3344
39	107 $\frac{1}{4}$	214 $\frac{1}{2}$	429	858	1287	1716	2145	2574	3003	3432
40	110	220	440	880	1320	1760	2200	2640	3080	3520
41	112 $\frac{1}{2}$	225 $\frac{1}{2}$	451	902	1353	1804	2255	2706	3157	3608
42	115 $\frac{1}{4}$	231	462	924	1386	1848	2310	2772	3234	3696
43	118 $\frac{1}{4}$	236 $\frac{1}{2}$	473	946	1419	1892	2365	2838	3311	3784
44	121	242	484	968	1452	1936	2420	2904	3388	3872
45	123 $\frac{1}{2}$	247 $\frac{1}{2}$	495	990	1485	1980	2475	2970	3465	3960
46	126 $\frac{1}{4}$	253	506	1012	1518	2024	2530	3036	3542	4048
47	129 $\frac{1}{4}$	258 $\frac{1}{2}$	517	1034	1551	2068	2585	3102	3619	4136
48	132	264	528	1056	1584	2112	2640	3168	3696	4224
49	134 $\frac{1}{2}$	269 $\frac{1}{2}$	539	1078	1617	2156	2695	3234	3773	4312
50	137 $\frac{1}{2}$	275	550	1100	1650	2200	2750	3300	3850	4400

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 11 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	99	110	121	132	143	154	165	176	187	198
2	198	220	242	264	286	308	330	352	374	396
3	297	330	363	396	429	462	495	528	561	594
4	396	440	484	528	572	616	660	704	748	792
5	495	550	605	660	715	770	825	880	935	990
6	594	660	726	792	858	924	990	1056	1122	1188
7	693	770	847	924	1001	1078	1155	1232	1309	1386
8	792	880	968	1056	1144	1232	1320	1408	1496	1584
9	891	990	1089	1188	1287	1386	1485	1584	1683	1782
10	990	1100	1210	1320	1430	1540	1650	1760	1870	1980
11	1089	1210	1331	1452	1573	1694	1815	1936	2057	2178
12	1188	1320	1452	1584	1716	1848	1980	2112	2244	2376
13	1287	1430	1573	1716	1859	2002	2145	2288	2431	2574
14	1386	1540	1694	1848	2002	2156	2310	2464	2618	2772
15	1485	1650	1815	1980	2145	2310	2475	2640	2805	2970
16	1584	1760	1936	2112	2288	2464	2640	2816	2992	3168
17	1683	1870	2057	2244	2431	2618	2805	2992	3179	3266
18	1782	1980	2178	2376	2574	2772	2970	3168	3366	3564
19	1881	2090	2299	2508	2717	2926	3135	3344	3553	3762
20	1980	2200	2420	2640	2860	3080	3300	3520	3740	3960
21	2079	2310	2541	2772	3003	3234	3465	3696	3927	4158
22	2178	2420	2662	2904	3146	3388	3630	3872	4114	4356
23	2277	2530	2783	3036	3289	3542	3795	4048	4301	4554
24	2376	2640	2904	3168	3432	3696	3960	4224	4488	4752
25	2475	2750	3025	3300	3575	3850	4125	4400	4675	4950
26	2574	2860	3146	3432	3718	4004	4290	4576	4862	5148
27	2673	2970	3267	3564	3861	4158	4455	4752	5049	5346
28	2772	3080	3388	3696	4004	4312	4620	4928	5236	5544
29	2871	3190	3509	3828	4147	4466	4785	5104	5423	5742
30	2970	3300	3630	3960	4290	4620	4950	5280	5610	5940
31	3069	3410	3751	4092	4433	4774	5115	5456	5797	6138
32	3168	3520	3872	4224	4576	4928	5280	5632	5984	6336
33	3267	3630	3993	4356	4719	5082	5445	5808	6171	6534
34	3366	3740	4114	4488	4862	5236	5610	5984	6358	6732
35	3465	3850	4235	4620	5005	5390	5775	6160	6545	6930
36	3564	3960	4356	4752	5148	5544	5940	6333	6732	7128
37	3663	4070	4477	4884	5291	5698	6105	6512	6919	7326
38	3762	4180	4598	5016	5434	5852	6270	6688	7106	7524
39	3861	4290	4719	5148	5577	6006	6435	6864	7293	7722
40	3960	4400	4840	5280	5720	6160	6600	7040	7480	7920
41	4059	4510	4961	5412	5863	6314	6765	7216	7667	8118
42	4158	4620	5082	5544	6006	6468	6930	7392	7854	8316
43	4257	4730	5203	5676	6149	6622	7095	7568	8041	8514
44	4356	4840	5324	5808	6292	6776	7260	7744	8228	8712
45	4455	4950	5445	5940	6435	6930	7425	7920	8415	8910
46	4554	5060	5566	6072	6578	7084	7590	8096	8602	9108
47	4653	5170	5687	6204	6721	7238	7755	8272	8789	9306
48	4752	5280	5808	6336	6864	7392	7920	8448	8976	9504
49	4851	5390	5929	6468	7007	7546	8085	8624	9163	9702
50	4950	5500	6050	6600	7150	7700	8250	8800	9350	9900

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 12 feet.

Length.	Height.									
	$\frac{1}{2}$ ft.	$\frac{3}{4}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	3	6	12	24	36	48	60	72	84	96
2	6	12	24	48	72	96	120	144	168	192
3	9	18	36	72	108	144	180	216	252	288
4	12	24	48	96	144	192	240	288	336	384
5	15	30	60	120	180	240	300	360	420	480
6	18	36	72	144	216	288	360	432	504	576
7	21	42	84	168	252	336	420	504	588	672
8	24	48	96	192	288	384	480	576	672	768
9	27	54	108	216	324	432	540	648	756	864
10	30	60	120	240	360	480	600	720	840	960
11	33	66	132	264	396	528	660	792	924	1056
12	36	72	144	288	432	576	720	864	1008	1152
13	39	78	156	312	468	624	780	936	1092	1248
14	42	84	168	336	504	672	840	1008	1176	1344
15	45	90	180	360	540	720	900	1080	1260	1440
16	48	96	192	384	576	768	960	1152	1344	1536
17	51	102	204	408	602	816	1020	1224	1428	1632
18	54	108	216	432	648	864	1080	1296	-1512	1728
19	57	114	228	456	684	912	1140	1368	1596	1824
20	60	120	240	480	720	960	1200	1440	1680	1920
21	63	126	252	504	756	1008	1260	1512	1764	2016
22	66	132	264	528	792	1056	1320	1584	1848	2112
23	69	138	276	552	828	1104	1380	1656	1932	2208
24	72	144	288	576	864	1152	1440	1728	2016	2304
25	75	150	300	600	900	1200	1500	1800	2100	2400
26	78	156	312	624	936	1248	1560	1872	2184	2496
27	81	162	324	648	972	1296	1620	1944	2268	2592
28	84	168	336	672	1008	1344	1680	2016	2352	2688
29	87	174	348	696	1044	1392	1740	2088	2436	2784
30	90	180	360	720	1080	1440	1800	2160	2520	2880
31	93	186	372	744	1116	1488	1860	2232	2604	2976
32	96	192	384	768	1152	1536	1920	2304	2688	3072
33	99	198	396	792	1188	1584	1980	2376	2772	3168
34	102	204	408	816	1224	1632	2040	2448	2856	3264
35	105	210	420	840	1260	1680	2100	2520	2940	3360
36	108	216	432	864	1296	1728	2160	2592	3024	3456
37	111	222	444	888	1332	1776	2220	2664	3108	3552
38	114	228	456	912	1368	1824	2280	2736	3192	3648
39	117	234	468	936	1404	1872	2340	2808	3276	3744
40	120	240	480	960	1440	1920	2400	2880	3360	3840
41	123	246	492	984	1476	1968	2460	2952	3444	3936
42	126	252	504	1008	1512	2016	2520	3024	3528	4032
43	129	258	516	1032	1548	2064	2580	3096	3612	4128
44	132	264	528	1056	1584	2112	2640	3168	3696	4224
45	135	270	540	1080	1620	2160	2700	3240	3780	4320
46	138	278	552	1104	1656	2208	2760	3312	3864	4416
47	141	282	564	1128	1692	2256	2820	3384	3948	4512
48	144	288	576	1152	1728	2304	2880	3456	4032	4608
49	147	294	588	1176	1764	2352	2940	3528	4116	4704
50	150	300	600	1200	1800	2400	3000	3600	4200	4800

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 12 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	108	120	132	144	156	168	180	192	204	216
2	216	240	264	288	312	336	360	384	408	432
3	324	360	396	432	468	504	540	576	612	648
4	432	480	528	576	624	672	720	768	816	864
5	540	600	660	720	780	840	900	960	1020	1080
6	648	720	792	864	936	1008	1080	1152	1224	1296
7	756	840	924	1008	1090	1176	1260	1344	1428	1512
8	864	960	1056	1152	1248	1344	1440	1536	1632	1728
9	972	1080	1188	1296	1404	1512	1620	1728	1836	1944
10	1080	1200	1320	1440	1560	1680	1800	1920	2040	2160
11	1188	1320	1452	1584	1716	1848	1980	2112	2244	2376
12	1296	1440	1584	1728	1872	2016	2160	2304	2448	2592
13	1404	1560	1716	1872	2028	2184	2340	2496	2652	2808
14	1512	1680	1848	2016	2184	2352	2520	2688	2856	3024
15	1620	1800	2080	2160	2340	2520	2700	2880	3060	3240
16	1728	1920	2212	2304	2496	2688	2880	3072	3264	3456
17	1836	2040	2344	2448	2652	2856	3060	3264	3468	3672
18	1944	2160	2476	2592	2808	3024	3240	3456	3672	3888
19	2052	2280	2508	2736	2964	3192	3420	3648	3876	4104
20	2160	2400	2640	2880	3120	3360	3600	3840	4080	4320
21	2268	2520	2772	3024	3276	3528	3780	4032	4284	4536
22	2376	2640	2904	3168	3432	3696	3960	4224	4488	4752
23	2484	2760	3036	3312	3588	3864	4140	4416	4692	4968
24	2592	2880	3168	3456	3744	4032	4320	4608	4896	5184
25	2700	3000	3300	3600	3900	4200	4500	4800	5100	5400
26	2808	3120	3432	3744	4056	4368	4680	4992	5304	5616
27	2916	3240	3564	3888	4212	4536	4860	5184	5508	5832
28	3024	3360	3696	4032	4368	4794	5040	5376	5712	6048
29	3132	3480	3828	4176	4524	4872	5220	5568	5916	6264
30	3240	3600	3960	4320	4680	5040	5400	5760	6120	6480
31	3348	3720	4092	4644	4836	5208	5580	5952	6324	6696
32	3456	3840	4224	4608	4992	5376	5760	6144	6528	6912
33	3564	3960	4356	4752	5148	5544	5940	6336	6732	7128
34	3672	4080	4488	4896	5304	5712	6120	6528	6936	7344
35	3780	4200	4620	5040	5460	5880	6300	6720	7140	7560
36	3888	4320	4752	5184	5616	6048	6480	6912	7344	7776
37	3996	4440	4884	5328	5772	6216	6660	7104	7548	7992
38	4104	4560	5016	5472	5928	6384	6840	7296	7752	8208
39	4212	4680	5148	5616	6084	6552	7020	7488	7956	8424
40	4320	4800	5280	5760	6240	6720	7200	7680	8160	8640
41	4428	4920	5412	5904	6396	6888	7380	7872	8364	8856
42	4536	5040	5544	6048	6552	7056	7560	8064	8568	9072
43	4644	5160	5676	6192	6708	7224	7740	8256	8772	9288
44	4752	5280	5808	6336	6864	7392	7920	8448	8976	9504
45	4860	5400	5940	6480	7020	7560	8100	8640	9180	9720
46	4968	5520	6072	6624	7176	7728	8280	8832	9384	9936
47	5076	5640	6204	6768	7332	7896	8460	9024	9588	10152
48	5184	5760	6336	6912	7488	8064	8640	9216	9792	10368
49	5292	5880	6468	7056	7644	8232	8820	9408	9996	10588
50	5400	6000	6600	7200	7800	8400	9000	9600	10200	10800

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 13 feet.

Length.	Height.									
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	$3\frac{1}{4}$	$6\frac{1}{2}$	13	26	39	52	65	78	91	10
2	$6\frac{1}{2}$	13	26	52	78	104	130	156	182	20
3	$9\frac{3}{4}$	$19\frac{1}{2}$	39	78	117	156	195	234	273	31
4	13	26	52	104	156	208	260	312	364	41
5	$16\frac{1}{2}$	$32\frac{1}{2}$	65	130	195	260	325	390	455	52
6	$19\frac{3}{4}$	39	78	156	234	312	390	468	546	62
7	$22\frac{1}{2}$	$45\frac{1}{2}$	91	182	273	364	455	546	637	72
8	26	52	104	208	312	416	520	624	728	83
9	$29\frac{1}{4}$	$58\frac{1}{2}$	117	234	351	468	585	702	819	93
10	32	65	130	260	390	520	650	780	910	104
11	$35\frac{1}{2}$	$71\frac{1}{2}$	143	286	429	572	715	858	1001	114
12	39	78	156	312	468	624	780	936	1092	124
13	$42\frac{1}{4}$	$84\frac{1}{2}$	169	338	507	676	845	1014	1183	135
14	$45\frac{3}{4}$	91	182	364	546	728	910	1092	1274	145
15	$48\frac{1}{2}$	$97\frac{1}{2}$	195	390	585	780	975	1170	1365	156
16	52	104	208	416	624	832	1040	1248	1456	166
17	$55\frac{1}{2}$	$110\frac{1}{2}$	221	442	663	884	1105	1326	1547	176
18	$58\frac{3}{4}$	117	234	468	702	936	1170	1404	1638	187
19	61	$123\frac{1}{2}$	247	494	741	988	1235	1482	1729	197
20	65	130	260	520	780	1040	1300	1560	1820	208
21	$68\frac{1}{2}$	$136\frac{1}{2}$	273	546	819	1092	1365	1638	1911	218
22	$71\frac{3}{4}$	143	286	572	858	1144	1430	1716	2002	228
23	$74\frac{1}{2}$	$149\frac{1}{2}$	299	598	897	1196	1495	1794	2093	238
24	78	156	312	624	936	1248	1560	1872	2184	248
25	$81\frac{1}{4}$	$162\frac{1}{2}$	325	650	975	1300	1625	1950	2275	260
26	$84\frac{3}{4}$	169	338	676	1014	1350	1690	2028	2366	270
27	$87\frac{1}{2}$	$175\frac{1}{2}$	351	702	1053	1404	1755	2106	2457	280
28	91	182	364	728	1092	1456	1820	2184	2548	291
29	$94\frac{1}{4}$	$188\frac{1}{2}$	377	754	1131	1508	1885	2262	2639	301
30	$97\frac{3}{4}$	195	390	780	1170	1560	1950	2340	2730	312
31	100	$201\frac{1}{2}$	403	806	1209	1612	2015	2418	2821	322
32	104	208	416	832	1248	1664	2080	2496	2912	332
33	$107\frac{1}{4}$	$214\frac{1}{2}$	429	858	1287	1716	2145	2574	3003	343
34	$110\frac{3}{4}$	221	442	884	1326	1768	2210	2652	3094	353
35	113	$227\frac{1}{2}$	455	910	1365	1820	2275	2730	3185	364
36	117	234	468	936	1404	1872	2340	2808	3276	374
37	$120\frac{1}{4}$	$240\frac{1}{2}$	481	962	1443	1924	2405	2886	3367	384
38	$123\frac{3}{4}$	247	494	988	1496	1976	2470	2964	3458	395
39	$126\frac{1}{2}$	$253\frac{1}{2}$	507	1014	1521	2028	2535	3042	3549	405
40	130	260	520	1040	1560	2080	2600	3120	3640	416
41	$133\frac{1}{4}$	$266\frac{1}{2}$	533	1066	1599	2132	2665	3198	3731	426
42	$136\frac{3}{4}$	273	546	1092	1638	2184	2730	3276	3822	436
43	$139\frac{1}{2}$	$279\frac{1}{2}$	559	1118	1677	2236	2795	3354	3913	447
44	143	286	572	1144	1716	2288	2860	3432	4004	457
45	$146\frac{1}{4}$	$292\frac{1}{2}$	585	1170	1755	2340	2925	3510	4095	468
46	$149\frac{3}{4}$	299	598	1196	1794	2392	2990	3588	4186	478
47	$152\frac{1}{2}$	$305\frac{1}{2}$	611	1222	1833	2444	3055	3666	4277	488
48	156	312	624	1248	1872	2496	3120	3744	4368	499
49	$159\frac{1}{4}$	$318\frac{1}{2}$	637	1274	1911	2548	3185	3822	4459	509
50	$162\frac{3}{4}$	325	650	1300	1950	2600	3250	3900	4550	520

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 13 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	117	130	143	156	169	182	195	208	221	234
2	234	260	286	312	338	364	390	416	442	468
3	351	390	429	468	507	546	585	624	663	702
4	468	520	572	624	676	728	780	832	884	936
5	585	650	715	780	845	910	975	1040	1105	1170
6	702	780	858	936	1014	1092	1170	1248	1326	1404
7	819	910	1001	1092	1183	1274	1365	1456	1547	1638
8	936	1040	1144	1248	1352	1456	1560	1664	1768	1872
9	1053	1170	1287	1404	1521	1638	1755	1872	1989	2106
10	1170	1300	1430	1560	1690	1820	1950	2080	2210	2340
11	1287	1430	1573	1716	1859	2002	2145	2288	2431	2574
12	1404	1560	1716	1872	2028	2184	2340	2496	2652	2808
13	1521	1690	1859	2028	2197	2366	2535	2704	2873	3042
14	1638	1820	2002	2184	2366	2548	2730	2912	3094	3276
15	1755	1950	2145	2340	2535	2730	2925	3120	3315	3510
16	1872	2080	2288	2496	2704	2912	3120	3328	3536	3744
17	1989	2210	2431	2652	2873	3094	3315	3536	3757	3878
18	2106	2340	2574	2808	3042	3276	3510	3744	3978	4212
19	2223	2470	2717	2964	3211	3458	3705	3952	4199	4446
20	2340	2600	2860	3120	3380	3640	3900	4160	4420	4680
21	2457	2730	3003	3276	3549	3822	4095	4368	4641	4914
22	2574	2860	3146	3432	3718	4004	4290	4576	4862	5148
23	2691	2990	3289	3588	3887	4186	4485	4784	5083	5382
24	2808	3120	3432	3744	4056	4368	4680	4992	5304	5616
25	2925	3250	3575	3900	4225	4550	4875	5200	5525	5850
26	3042	3380	3718	4056	4394	4732	5070	5408	5746	6084
27	3159	3510	3861	4212	4563	4914	5265	5616	5967	6318
28	3276	3640	4004	4368	4732	5096	5460	5824	6188	6552
29	3393	3770	4147	4524	4901	5278	5655	6032	6409	6786
30	3510	3900	4290	4690	5070	5460	5850	6240	6630	7020
31	3627	4030	4430	4836	5239	5642	6045	6448	6851	7254
32	3744	4160	4576	4992	5408	5824	6240	6656	7072	7488
33	3861	4290	4719	5148	5577	6006	6435	6864	7293	7722
34	3978	4420	4862	5304	5746	6188	6630	7072	7514	7956
35	4095	4550	5005	5460	5915	6370	6825	7280	7735	8190
36	4212	4680	5148	5616	6084	6552	7020	7488	7956	8424
37	4329	4810	5291	5772	6253	6734	7215	7696	8177	8658
38	4446	4940	5434	5928	6422	6916	7410	7904	8398	8892
39	4563	5070	5577	6084	6591	7098	7605	8112	8619	9126
40	4680	5200	5720	6240	6760	7280	7800	8320	8840	9360
41	4797	5330	5863	6396	6929	7462	7995	8528	9061	9594
42	4914	5460	6006	6552	7098	7644	8190	8736	9282	9828
43	5031	5590	6149	6708	7267	7826	8385	8944	9503	10062
44	5148	5720	6292	6864	7436	8008	8580	9152	9724	10296
45	5265	5850	6435	7020	7605	8190	8775	9360	9945	10530
46	5382	5980	6578	7176	7774	8372	8970	9568	10166	10764
47	5499	6110	6721	7332	7943	8554	9165	9776	10387	10998
48	5616	6240	6864	7488	8112	8736	9360	9984	10608	11232
49	5733	6370	7007	7644	8281	8918	9555	10192	10829	11466
50	5850	6500	7150	7800	8450	9100	9750	10400	11050	11700

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 14 feet.

Length.	Height.									
	$\frac{1}{2}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	3 $\frac{1}{2}$	7	14	28	42	56	70	84	98	112
2	7	14	28	56	84	112	140	168	196	224
3	10 $\frac{1}{2}$	21	42	84	126	156	210	252	294	336
4	14	28	56	112	168	208	280	336	392	448
5	17 $\frac{1}{2}$	35	70	140	210	260	350	420	490	560
6	21	42	84	168	252	312	420	504	588	672
7	24 $\frac{1}{2}$	49	98	196	294	364	490	588	686	784
8	28	56	112	224	336	416	560	672	784	896
9	31 $\frac{1}{2}$	63	126	252	378	468	630	756	882	1008
10	35	70	140	280	420	520	700	840	980	1120
11	38 $\frac{1}{2}$	77	154	308	462	572	770	924	1078	1232
12	42	84	168	336	504	624	840	1008	1176	1344
13	45 $\frac{1}{2}$	91	182	364	546	676	910	1092	1274	1456
14	49	98	196	392	588	728	980	1176	1372	1568
15	52 $\frac{1}{2}$	105	210	420	630	780	1050	1260	1470	1680
16	56	112	224	448	672	832	1120	1344	1568	1792
17	59 $\frac{1}{2}$	119	238	476	714	884	1190	1428	1666	1904
18	63	126	252	504	756	936	1260	1512	1764	2016
19	66 $\frac{1}{2}$	133	266	532	798	988	1330	1596	1862	2128
20	70	140	280	560	840	1040	1400	1680	1960	2240
21	73 $\frac{1}{2}$	147	294	588	882	1092	1470	1764	2058	2352
22	77	154	308	616	924	1144	1540	1848	2156	2264
23	80 $\frac{1}{2}$	161	322	644	966	1196	1610	1932	2254	2576
24	84	168	336	672	1008	1248	1680	2016	2352	2688
25	87 $\frac{1}{2}$	175	350	700	1050	1300	1750	2100	2450	2800
26	91	182	364	728	1092	1352	1820	2184	2548	2912
27	94 $\frac{1}{2}$	189	378	756	1134	1404	1890	2268	2646	3024
28	98	196	392	784	1176	1456	1960	2352	2744	3136
29	101 $\frac{1}{2}$	203	406	812	1218	1508	2030	2436	2842	3248
30	105	210	420	840	1260	1560	2100	2520	2940	3360
31	108 $\frac{1}{2}$	217	434	868	1302	1612	2170	2640	3038	3472
32	112	224	448	896	1344	1664	2240	2688	3136	3584
33	115 $\frac{1}{2}$	231	462	924	1386	1716	2310	2772	3234	3696
34	119	238	476	952	1428	1768	2380	2856	3332	3808
35	122 $\frac{1}{2}$	245	490	980	1470	1820	2450	2940	3430	3920
36	126	252	504	1008	1512	1872	2520	3024	3528	4032
37	129 $\frac{1}{2}$	259	518	1036	1554	1924	2590	3108	3626	4144
38	133	266	532	1064	1596	1976	2660	3192	3724	4256
39	136 $\frac{1}{2}$	273	546	1092	1638	2028	2730	3276	3822	4368
40	140	280	560	1120	1680	2080	2800	3360	3920	4480
41	143 $\frac{1}{2}$	287	574	1148	1722	2132	2870	3444	4018	4592
42	147	294	588	1176	1764	2184	2940	3528	4116	4704
43	150 $\frac{1}{2}$	301	602	1204	1806	2236	3010	3612	4214	4816
44	154	308	616	1232	1848	2288	3080	3696	4312	4928
45	157 $\frac{1}{2}$	315	630	1260	1890	2340	3150	3780	4410	5040
46	161	322	644	1288	1932	2392	3220	3864	4508	5152
47	164 $\frac{1}{2}$	329	658	1316	1974	2444	3290	3948	4606	5264
48	168	336	672	1344	2016	2496	3360	4032	4704	5376
49	171 $\frac{1}{2}$	343	686	1472	2058	2548	3430	4116	4802	5488
50	175	350	700	1400	2100	2600	3500	4200	4900	5600

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 14 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	126	140	154	168	182	196	210	224	238	252
2	252	280	308	336	364	392	420	448	476	504
3	378	420	462	504	546	588	630	672	714	756
4	504	560	616	672	728	784	840	896	952	1008
5	630	700	770	840	910	980	1050	1120	1190	1260
6	756	840	924	1008	1092	1176	1260	1344	1428	1512
7	882	980	1078	1176	1274	1372	1470	1568	1666	1764
8	1008	1120	1232	1344	1456	1568	1680	1792	1904	2016
9	1134	1260	1386	1512	1638	1764	1890	2016	2142	2268
10	1260	1400	1540	1680	1820	1960	2100	2240	2380	2520
11	1386	1540	1694	1848	2002	2156	2310	2464	2618	2772
12	1512	1680	1848	2016	2184	2352	2520	2688	2856	3024
13	1638	1820	2002	2184	2366	2548	2730	2912	3094	3276
14	1764	1960	2156	2352	2548	2744	2940	3136	3332	3528
15	1890	2100	2310	2520	2730	2940	3150	3360	3570	3780
16	2016	2240	2464	2688	2912	3136	3360	3584	3808	4032
17	2142	2380	2618	2856	3094	3332	3570	3808	4046	4284
18	2268	2520	2772	3024	3276	3528	3780	4032	4284	4536
19	2394	2660	2926	3192	3458	3724	3990	4256	4522	4788
20	2520	2800	3080	3360	3640	3920	4200	4480	4760	5040
21	2646	2940	3234	3528	3822	4116	4410	4704	4998	5292
22	2772	3080	3388	3696	4004	4312	4620	4928	5236	5544
23	2898	3220	3542	3864	4186	4508	4830	5152	5474	5796
24	3024	3360	3696	4032	4368	4704	5040	5376	5712	6048
25	3150	3500	3850	4200	4550	4900	5250	5600	5950	6300
26	3276	3640	4004	4368	4732	5096	5460	5824	6188	6552
27	3402	3780	4158	4536	4914	5292	5670	6048	6426	6804
28	3528	3920	4312	4704	5096	5488	5880	6272	6664	7056
29	3654	4060	4466	4872	5278	5684	6090	6496	6902	7308
30	3780	4200	4620	5040	5460	5880	6300	6720	7140	7560
31	3906	4340	4774	5208	5642	6076	6510	6944	7378	7812
32	4032	4480	4928	5376	5824	6272	6720	7168	7616	8064
33	4158	4620	5082	5544	6006	6468	6930	7392	7854	8316
34	4284	4760	5236	5712	6188	6664	7140	7616	8092	8568
35	4410	4900	5390	5880	6370	6860	7350	7840	8330	8820
36	4536	5040	5544	6048	6552	7056	7560	8064	8568	9072
37	4662	5180	5698	6216	6734	7252	7770	8288	8806	9324
38	4788	5320	5852	6384	6916	7448	7980	8512	9044	9576
39	4914	5460	6006	6552	7098	7644	8190	8736	9282	9828
40	5040	5600	6160	6720	7280	7840	8400	8960	9520	10080
41	5166	5740	6314	6888	7462	8036	8610	9184	9758	10332
42	5292	5880	6468	7056	7644	8232	8820	9408	9996	10584
43	5418	6020	6622	7224	7826	8428	9030	9632	10234	10836
44	5544	6160	6776	7392	8008	8624	9240	9856	10472	11088
45	5670	6300	6930	7560	8190	8820	9450	10080	10710	11340
46	5796	6440	7084	7728	8372	9016	9660	10304	10948	11592
47	5922	6580	7238	7896	8554	9212	9870	10528	11186	11844
48	6048	6720	7392	8064	8736	9408	10080	10752	11424	12096
49	6174	6860	7546	8232	8918	9604	10290	10976	11662	12348
50	6300	7000	7700	8400	9100	9800	10500	11200	11900	12600

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 15 feet.

Length.	Height.								
	$\frac{1}{2}$ ft.	$\frac{3}{4}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.
1	$3\frac{3}{4}$	$7\frac{1}{2}$	15	30	45	60	75	90	105
2	$7\frac{1}{2}$	15	30	60	90	120	150	180	210
3	$11\frac{1}{2}$	$22\frac{1}{2}$	45	90	135	180	225	270	315
4	15	30	60	120	180	240	300	360	420
5	$18\frac{3}{4}$	$37\frac{1}{2}$	75	150	225	300	375	450	525
6	$22\frac{1}{2}$	45	90	180	270	360	450	540	630
7	$26\frac{1}{2}$	$52\frac{1}{2}$	105	210	315	420	525	630	735
8	30	60	120	240	360	480	600	720	840
9	$33\frac{3}{4}$	$67\frac{1}{2}$	135	270	405	540	675	810	945
10	$37\frac{1}{2}$	75	150	300	450	600	750	900	1050
11	$41\frac{1}{2}$	$82\frac{1}{2}$	165	330	495	660	825	990	1155
12	45	90	180	360	540	720	900	1080	1260
13	$48\frac{3}{4}$	$97\frac{1}{2}$	195	390	585	780	975	1170	1365
14	$52\frac{1}{2}$	105	210	420	630	840	1050	1260	1470
15	$56\frac{1}{2}$	$112\frac{1}{2}$	225	450	675	900	1125	1350	1575
16	60	120	240	480	720	960	1200	1440	1680
17	$63\frac{3}{4}$	$127\frac{1}{2}$	255	510	765	1020	1275	1530	1785
18	$67\frac{1}{2}$	135	270	540	810	1080	1350	1620	1890
19	$71\frac{1}{2}$	$142\frac{1}{2}$	285	570	855	1140	1425	1710	1995
20	75	150	300	600	900	1200	1500	1800	2100
21	$78\frac{3}{4}$	$157\frac{1}{2}$	315	630	945	1260	1575	1890	2205
22	$82\frac{1}{2}$	165	330	660	990	1320	1650	1980	2310
23	$86\frac{1}{2}$	$172\frac{1}{2}$	345	690	1035	1380	1725	2070	2415
24	90	180	360	720	1080	1440	1800	2160	2520
25	$93\frac{3}{4}$	$187\frac{1}{2}$	375	750	1125	1500	1875	2250	2625
26	$97\frac{1}{2}$	195	390	780	1170	1560	1950	2340	2730
27	$101\frac{1}{2}$	$202\frac{1}{2}$	405	810	1215	1620	2025	2430	2835
28	105	210	420	840	1260	1680	2100	2520	2940
29	$108\frac{3}{4}$	$217\frac{1}{2}$	435	870	1305	1740	2175	2610	3045
30	$112\frac{1}{2}$	225	450	900	1350	1800	2250	2700	3150
31	$116\frac{1}{2}$	$232\frac{1}{2}$	465	930	1395	1860	2325	2790	3255
32	120	240	480	960	1440	1920	2400	2880	3360
33	$123\frac{3}{4}$	$247\frac{1}{2}$	495	990	1485	1980	2475	2970	3465
34	$127\frac{1}{2}$	255	510	1020	1530	2040	2550	3060	3570
35	$131\frac{1}{2}$	$262\frac{1}{2}$	525	1050	1575	2100	2625	3150	3675
36	135	270	540	1080	1620	2160	2700	3240	3780
37	$138\frac{3}{4}$	$277\frac{1}{2}$	555	1110	1665	2220	2775	3330	3885
38	$142\frac{1}{2}$	285	570	1140	1710	2280	2850	3420	3990
39	$146\frac{1}{2}$	$292\frac{1}{2}$	585	1170	1755	2340	2925	3510	4095
40	150	300	600	1200	1800	2400	3000	3600	4200
41	$153\frac{3}{4}$	$307\frac{1}{2}$	615	1230	1845	2460	3075	3690	4305
42	$157\frac{1}{2}$	315	630	1260	1890	2520	3150	3780	4410
43	$161\frac{1}{2}$	$322\frac{1}{2}$	645	1290	1935	2580	3225	3870	4515
44	165	330	660	1320	2080	2640	3300	3960	4620
45	$168\frac{3}{4}$	$337\frac{1}{2}$	675	1350	2125	2700	3375	4050	4725
46	$172\frac{1}{2}$	345	690	1380	2170	2760	3450	4140	4830
47	$176\frac{1}{2}$	$352\frac{1}{2}$	705	1410	2215	2820	3525	4230	4935
48	180	360	720	1440	2260	2880	3600	4320	5040
49	$183\frac{3}{4}$	$367\frac{1}{2}$	735	1470	2305	2940	3675	4410	5145
50	$187\frac{1}{2}$	375	750	1500	2350	3000	3750	4500	5250

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 15 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	135	150	165	180	195	210	225	240	255	270
2	270	300	330	360	390	420	450	480	510	540
3	405	450	495	540	585	630	675	720	765	810
4	540	600	660	720	780	840	900	960	1020	1080
5	675	750	825	900	975	1050	1125	1200	1275	1350
6	810	900	990	1080	1170	1260	1350	1440	1530	1620
7	945	1050	1155	1260	1365	1470	1575	1680	1785	1890
8	1080	1200	1320	1440	1560	1680	1800	1920	2040	2160
9	1215	1350	1485	1620	1755	1890	2025	2160	2295	2430
10	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
11	1485	1650	1815	1980	2145	2310	2475	2640	2805	2970
12	1620	1800	1980	2160	2340	2520	2700	2880	3060	3240
13	1755	1950	2145	2340	2535	2730	2925	3120	3315	3510
14	1890	2100	2310	2520	2730	2940	3150	3360	3570	3780
15	2025	2250	2475	2700	2925	3150	3375	3600	3825	4050
16	2160	2400	2640	2880	3120	3360	3600	3840	4080	4320
17	2295	2550	2805	3060	3315	3570	3825	4080	4335	4590
18	2430	2700	2970	3240	3510	3780	4050	4320	4590	4860
19	2565	2850	3135	3420	3705	3990	4275	4560	4845	5130
20	2700	3000	3300	3600	3900	4200	4500	4800	5100	5400
21	2835	3150	3465	3780	4095	4410	4725	5040	5355	5670
22	2970	3300	3630	3960	4290	4620	4950	5280	5610	5940
23	3105	3450	3795	4140	4485	4830	5175	5520	5865	6210
24	3240	3600	3960	4320	4680	5040	5400	5760	6120	6480
25	3375	3750	4125	4500	4875	5250	5625	6000	6375	6750
26	3510	3900	4290	4680	5070	5460	5850	6240	6630	7020
27	3645	4050	4455	4860	5265	5670	6075	6480	6885	7290
28	3780	4200	4620	5040	5460	5880	6300	6720	7140	7560
29	3915	4350	4785	5220	5655	6090	6525	6960	7395	7830
30	4050	4500	4950	5400	5850	6300	6750	7200	7650	8100
31	4185	4650	5115	5580	6045	6510	6975	7440	7905	8370
32	4320	4800	5280	5760	6240	6720	7200	7680	8160	8640
33	4455	4950	5445	5940	6435	6930	7425	7920	8415	8910
34	4590	5100	5610	6120	6630	7140	7650	8160	8670	9180
35	4725	5250	5775	6300	6825	7350	7875	8400	8925	9450
36	4860	5400	5940	6480	7020	7560	8100	8640	9180	9720
37	4995	5550	6105	6660	7215	7770	8325	8880	9435	9990
38	5130	5700	6270	6840	7410	7980	8550	9120	9690	10260
39	5265	5850	6435	7020	7605	8190	8775	9360	9945	10530
40	5400	6000	6600	7200	7800	8400	9000	9600	10200	10800
41	5535	6150	6765	7380	7995	8610	9225	9840	10455	11070
42	5670	6300	6930	7560	8190	8820	9450	10080	10710	11340
43	5805	6450	7095	7740	8385	9030	9675	10320	10965	11610
44	5940	6600	7260	7920	8580	9240	9900	10560	11220	11880
45	6075	6750	7245	8100	8775	9450	10125	10800	11475	12150
46	6210	6900	7590	8280	8970	9660	10350	11040	11730	12420
47	6345	7050	7755	8460	9169	9870	10575	11280	11985	12690
48	6480	7200	7920	8640	9360	10080	10800	11520	12240	12960
49	6615	7350	8085	8820	9555	10290	11025	11760	12495	13230
50	6750	7500	8250	9000	9750	10500	11250	12000	12750	13500

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 16 feet.

Length.	Height.									
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	4	8	16	32	48	64	80	96	112	128
2	8	16	32	64	96	128	160	192	224	256
3	12	24	48	96	144	192	240	288	336	384
4	16	32	64	128	192	256	320	384	448	512
5	20	40	80	160	240	320	400	480	560	640
6	24	48	96	192	288	384	480	576	672	768
7	28	56	112	224	336	448	560	672	784	896
8	32	64	128	256	384	512	640	768	896	1024
9	36	72	144	288	432	576	720	864	1008	1152
10	40	80	160	320	480	640	800	960	1120	1280
11	44	88	176	352	528	704	880	1056	1232	1408
12	48	96	192	384	576	768	960	1152	1344	1536
13	52	104	208	416	624	832	1040	1248	1456	1664
14	56	112	224	448	672	896	1120	1344	1568	1792
15	60	120	240	480	720	960	1200	1440	1680	1920
16	64	128	256	512	768	1024	1280	1536	1792	2048
17	68	136	272	544	816	1088	1360	1632	1904	2176
18	72	144	288	576	864	1152	1440	1728	2016	2304
19	76	152	304	608	912	1216	1520	1824	2128	2432
20	80	160	320	640	960	1280	1600	1920	2240	2560
21	84	168	336	672	1008	1344	1680	2016	2352	2688
22	88	176	352	704	1056	1408	1760	2112	2464	2816
23	92	184	368	736	1104	1472	1840	2208	2576	2944
24	96	192	384	768	1152	1536	1920	2304	2688	3072
25	100	200	400	800	1200	1600	2000	2400	2800	3200
26	104	208	416	832	1248	1664	2080	2496	2912	3328
27	108	216	432	848	1296	1728	2160	2592	3024	3456
28	112	224	448	896	1344	1792	2240	2688	3136	3584
29	116	232	464	928	1392	1856	2320	2784	3248	3712
30	120	240	480	960	1440	1920	2400	2880	3360	3840
31	124	248	496	992	1488	1984	2480	2976	3472	3968
32	128	256	512	1024	1536	2048	2560	3072	3584	4096
33	132	264	528	1056	1584	2112	2640	3168	3696	4224
34	136	272	544	1088	1632	2176	2720	3264	3808	4352
35	140	280	560	1120	1680	2240	2800	3360	3920	4480
36	144	288	576	1152	1728	2304	2880	3456	4032	4608
37	148	296	592	1184	1776	2368	2960	3552	4144	4736
38	152	304	608	1216	1824	2432	3040	3648	4256	4864
39	156	312	624	1248	1872	2496	3120	3744	4368	4992
40	160	320	640	1280	1920	2560	3200	3840	4480	5120
41	164	328	656	1312	1968	2624	3280	3936	4592	5248
42	168	336	672	1344	2016	2688	3360	4032	4704	5376
43	172	344	688	1376	2064	2752	3440	4128	4816	5504
44	176	352	704	1408	2112	2816	3520	4224	4928	5632
45	180	360	720	1440	2160	2880	3600	4320	5040	5760
46	184	368	736	1472	2208	2944	3680	4416	5152	5888
47	188	376	752	1504	2256	3008	3760	4512	5264	6016
48	192	384	768	1536	2304	3072	3840	4608	5376	6144
49	196	392	784	1568	2352	3136	3920	4704	5488	6272
50	200	400	800	1600	2400	3200	4000	4800	5600	6400

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 16 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	144	160	176	192	208	224	240	256	272	288
2	288	320	352	384	416	448	480	512	544	576
3	432	480	528	576	624	672	720	768	816	864
4	576	640	704	768	832	896	960	1024	1088	1152
5	720	800	880	960	1040	1120	1200	1280	1360	1440
6	864	960	1056	1152	1248	1344	1440	1536	1632	1728
7	1008	1120	1232	1344	1456	1568	1680	1792	1904	2016
8	1152	1280	1408	1536	1664	1792	1920	2048	2176	2304
9	1296	1440	1584	1728	1872	2016	2160	2204	2448	2592
10	1440	1600	1760	1920	2080	2240	2400	2560	2720	2880
11	1584	1760	1936	2112	2288	2464	2640	2816	2992	3168
12	1728	1920	2112	2304	2496	2688	2880	3072	3264	3456
13	1872	2080	2288	2496	2704	2912	3120	3328	3536	3744
14	2016	2240	2464	2688	2912	3136	3360	3584	3808	4032
15	2160	2400	2640	2880	3120	3360	3600	3840	4080	4320
16	2304	2560	2816	3072	3328	3584	3840	4096	4352	4608
17	2448	2720	2992	3264	3536	3808	4080	4352	4624	4896
18	2592	2880	3168	3456	3744	4032	4320	4608	4896	5184
19	2736	3040	3344	3648	3952	4456	4560	4864	5168	5472
20	2880	3200	3520	3840	4160	4480	4800	5120	5440	5760
21	3024	3360	3696	4032	4368	4704	5040	5376	5712	6048
22	3168	3520	3872	4224	4576	4928	5280	5632	5984	6336
23	3312	3680	4048	4416	4784	5152	5520	5888	6256	6624
24	3456	3840	4224	4608	4992	5376	5760	6144	6528	6912
25	3600	4000	4400	4800	5200	5600	6000	6400	6800	7200
26	3744	4160	4576	4992	5408	5824	6240	6656	7072	7488
27	3888	4320	4752	5184	5616	6048	6480	6912	7344	7776
28	4032	4480	4928	5376	5824	6272	6720	7168	7616	8064
29	4176	4640	5104	5568	6032	6496	6960	7424	7888	8352
30	4320	4800	5280	5760	6240	6720	7200	7680	8160	8640
31	4464	4960	5456	5920	6448	6944	7440	8036	8432	8928
32	4608	5120	5632	6144	6656	7168	7680	8292	8704	9216
33	4752	5280	5808	6336	6864	7392	7920	8548	8976	9504
34	4896	5440	5984	6528	7072	7616	8160	8804	9248	9792
35	5040	5600	6160	6720	7280	7840	8400	9060	9520	10080
36	5184	5760	6336	6912	7488	8064	8640	9316	9792	10368
37	5328	5920	6512	7104	7696	8288	8880	9572	10064	10656
38	5472	6080	6688	7296	7904	8512	9120	9828	10336	10944
39	5616	6240	6864	7488	8112	8736	9360	10084	10608	11232
40	5760	6400	7040	7680	8320	8960	9600	10240	10880	11520
41	5904	6560	7216	7872	8528	9184	9840	10496	11152	11808
42	6048	6720	7392	8064	8736	9408	10080	10752	11424	12096
43	6192	6880	7568	8256	8944	9632	10320	11008	11696	12384
44	6336	7040	7744	8448	9152	9856	10560	11264	11968	12672
45	6480	7200	7920	8640	9360	10080	10800	11520	12240	12960
46	6624	7360	8096	8832	9568	10304	11040	11776	12512	13248
47	6768	7520	8272	9024	9776	10528	11280	12032	12784	13536
48	6912	7680	8448	9216	9984	10752	11520	12288	13056	13824
49	7056	7840	8624	9408	10192	10976	11760	12544	13328	14112
50	7200	8000	8800	9600	10400	11200	12000	12800	13600	14400

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 7 feet.

Length.	Height.									
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	4 $\frac{1}{4}$	8 $\frac{1}{2}$	17	34	51	68	85	102	119	136
2	8 $\frac{1}{2}$	17	34	68	102	136	170	204	238	272
3	12 $\frac{3}{4}$	25 $\frac{1}{2}$	51	102	153	204	255	306	357	408
4	17	34	68	136	204	272	340	408	476	544
5	21 $\frac{1}{4}$	42 $\frac{1}{2}$	85	170	255	340	425	510	595	680
6	25 $\frac{1}{2}$	51	102	204	306	408	510	612	714	816
7	29 $\frac{3}{4}$	59 $\frac{1}{2}$	119	238	357	476	595	714	833	952
8	34	68	136	272	408	544	680	816	952	1088
9	38 $\frac{1}{4}$	76 $\frac{1}{2}$	153	306	459	612	765	918	1071	1224
10	42 $\frac{1}{2}$	85	170	340	510	680	850	1020	1190	1360
11	46 $\frac{3}{4}$	93 $\frac{1}{2}$	187	374	561	748	935	1122	1309	1496
12	51	102	204	408	612	816	1020	1224	1428	1632
13	55 $\frac{1}{4}$	110 $\frac{1}{2}$	221	442	663	884	1105	1326	1547	1768
14	59 $\frac{1}{2}$	119	238	476	714	952	1190	1428	1666	1904
15	63 $\frac{3}{4}$	127 $\frac{1}{2}$	255	510	765	1020	1275	1530	1785	2040
16	68	136	272	544	816	1088	1360	1632	1904	2176
17	72 $\frac{1}{4}$	144 $\frac{1}{2}$	289	578	867	1156	1445	1734	2023	2312
18	76 $\frac{3}{4}$	153	306	612	918	1224	1530	1836	2142	2448
19	80 $\frac{1}{4}$	161 $\frac{1}{2}$	323	646	969	1292	1615	1938	2261	2584
20	85	170	340	680	1020	1360	1700	2040	2380	2720
21	89 $\frac{1}{4}$	178 $\frac{1}{2}$	357	714	1071	1428	1785	2142	2499	2856
22	93 $\frac{3}{4}$	187	374	748	1122	1496	1870	2244	2618	2992
23	97 $\frac{1}{2}$	195 $\frac{1}{2}$	391	782	1173	1564	1955	2346	2737	3128
24	102	204	408	816	1224	1632	2040	2448	2856	3264
25	10 $\frac{3}{4}$	212 $\frac{1}{2}$	425	850	1275	1700	2125	2550	2975	3400
26	110 $\frac{1}{4}$	221	442	884	1326	1768	2210	2652	3094	3536
27	114 $\frac{3}{4}$	229 $\frac{1}{2}$	459	918	1377	1836	2295	2754	3213	3672
28	119	238	476	952	1428	1904	2380	2856	3332	3808
29	123 $\frac{1}{4}$	246 $\frac{1}{2}$	493	986	1479	1972	2465	2958	3451	3944
30	127 $\frac{3}{4}$	255	510	1020	1530	2040	2550	3060	3570	4080
31	131 $\frac{1}{4}$	263 $\frac{1}{2}$	527	1054	1581	2108	2635	3162	3689	4216
32	136	272	544	1088	1632	2176	2720	3264	3808	4352
33	140 $\frac{3}{4}$	280 $\frac{1}{2}$	561	1122	1683	2244	2805	3366	3927	4488
34	144 $\frac{1}{4}$	289	578	1156	1734	2312	2890	3468	4046	4624
35	148 $\frac{3}{4}$	297 $\frac{1}{2}$	595	1190	1785	2380	2975	3570	4165	4760
36	153	306	612	1224	1836	2448	3060	3672	4284	4896
37	157 $\frac{1}{4}$	314 $\frac{1}{2}$	629	1258	1887	2516	3145	3774	4403	5032
38	161 $\frac{3}{4}$	323	646	1292	1938	2584	3230	3876	4522	5168
39	165 $\frac{1}{4}$	331 $\frac{1}{2}$	663	1326	1989	2652	3315	3978	4641	5304
40	170	340	680	1360	2040	2720	3400	4080	4760	5440
41	174 $\frac{1}{4}$	348 $\frac{1}{2}$	697	1394	2091	2788	3485	4182	4879	5576
42	178 $\frac{3}{4}$	357	714	1428	2142	2856	3570	4284	4998	5712
43	182 $\frac{1}{4}$	365 $\frac{1}{2}$	731	1462	2193	2924	3655	4386	5117	5848
44	187	374	748	1496	2244	2992	3740	4488	5236	5984
45	191 $\frac{1}{4}$	382 $\frac{1}{2}$	765	1530	2295	3060	3825	4590	5355	6120
46	195 $\frac{3}{4}$	391	782	1564	2346	3128	3910	4692	5474	6256
47	199 $\frac{1}{4}$	399 $\frac{1}{2}$	799	1598	2397	3196	3995	4794	5593	6392
48	204	408	816	1632	2448	3264	4080	4896	5712	6528
49	208 $\frac{1}{4}$	416 $\frac{1}{2}$	833	1666	2499	3332	4165	4998	5831	6664
50	212 $\frac{3}{4}$	425	850	1700	2550	3400	4250	5100	5950	6800

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 17 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	153	170	187	204	221	238	255	272	289	306
2	306	340	374	408	442	476	510	544	578	612
3	459	510	561	612	663	714	765	816	867	918
4	612	680	748	816	884	952	1020	1088	1156	1224
5	765	850	935	1020	1105	1190	1275	1360	1445	1530
6	918	1020	1122	1224	1326	1428	1530	1632	1734	1836
7	1071	1190	1309	1428	1547	1666	1785	1904	2023	2142
8	1224	1360	1496	1632	1768	1904	2040	2176	2312	2448
9	1377	1530	1683	1836	1989	2142	2295	2448	2601	2754
10	1530	1700	1870	2040	2210	2380	2550	2720	2890	3060
11	1683	1870	2057	2244	2431	2618	2805	2992	3179	3366
12	1836	2040	2244	2448	2652	2856	3060	3264	3468	3672
13	1989	2210	2431	2652	2873	3094	3315	3536	3757	3978
14	2142	2380	2618	2856	3094	3332	3570	3808	4046	4284
15	2295	2550	2805	3060	3315	3570	3825	4080	4335	4590
16	2448	2720	2992	3264	3536	3808	4080	4352	4624	4896
17	2601	2890	3179	3468	3757	4046	4335	4624	4913	5202
18	2754	3060	3366	3672	3978	4284	4590	4896	5202	5508
19	2907	3230	3553	3876	4199	4522	4845	5168	5491	5814
20	3060	3400	3740	4080	4420	4760	5100	5440	5780	6120
21	3213	3570	3927	4284	4641	4998	5355	5712	6069	6426
22	3366	3740	4114	4488	4862	5236	5610	5984	6358	6732
23	3519	3910	4301	4692	5083	5474	5865	6256	6647	7038
24	3672	4080	4488	4896	5304	5712	6120	6528	6936	7344
25	3825	4250	4675	5100	5525	5950	6375	6800	7225	7650
26	3978	4420	4862	5304	5746	6188	6630	7072	7514	7956
27	4131	4590	5049	5508	5967	6426	6885	7344	7803	8262
28	4284	4760	5236	5712	6188	6664	7140	7616	8092	8568
29	4437	4930	5423	5916	6409	6902	7395	7888	8381	8874
30	4590	5100	5610	6120	6630	7140	7650	8160	8670	9180
31	4743	5270	5797	6324	6851	7378	7905	8432	8959	9486
32	4896	5440	5984	6528	7072	7616	8160	8704	9248	9792
33	5049	5610	6171	6732	7293	7854	8415	8976	9537	10098
34	5202	5780	6358	6936	7514	8092	8670	9248	9826	10404
35	5355	5950	6545	7140	7735	8330	8925	9520	10115	10710
36	5508	6120	6732	7344	7956	8568	9180	9792	10404	11016
37	5661	6290	6919	7548	8177	8806	9435	10064	10693	11322
38	5814	6460	7106	7752	8398	9044	9690	10336	10982	11628
39	5967	6630	7293	7956	8619	9282	9945	10608	11271	11934
40	6120	6800	7480	8160	8840	9520	10200	10880	11560	12240
41	6273	6970	7667	8364	9061	9758	10455	11152	11849	12546
42	6426	7140	7854	8568	9282	9996	10710	11424	12138	12852
43	6579	7310	8041	8772	9503	10234	10965	11696	12427	13158
44	6732	7480	8228	8976	9724	10472	11220	11968	12716	13464
45	6885	7650	8415	9180	9945	10710	11475	12240	13005	13770
46	7038	7820	8602	9384	10166	10948	11730	12512	13294	14076
47	7191	7990	8789	9588	10387	11186	11985	12784	13583	14382
48	7344	8160	8976	9792	10608	11424	12240	13056	13872	14688
49	7497	8330	9163	9996	10829	11662	12495	13328	14161	14994
50	7650	8500	9350	10200	11050	11900	12750	13600	14450	15300

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 18 feet.

Length.	Height.								
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.
1	4 $\frac{1}{2}$	9	18	36	54	72	90	108	126
2	9	18	36	72	108	144	180	216	252
3	13 $\frac{1}{2}$	27	54	108	162	216	270	324	358
4	18	36	72	144	216	288	360	432	504
5	22 $\frac{1}{2}$	45	90	180	270	360	450	540	630
6	27	54	108	216	324	432	540	648	756
7	31 $\frac{1}{2}$	63	126	252	378	504	630	756	882
8	36	72	144	288	432	576	720	864	1008
9	40 $\frac{1}{2}$	81	162	324	486	648	810	972	1134
10	45	90	180	360	540	720	900	1080	1260
11	49 $\frac{1}{2}$	99	198	396	594	792	990	1188	1386
12	54	108	216	432	648	864	1080	1296	1512
13	58 $\frac{1}{2}$	117	234	468	702	936	1170	1404	1638
14	63	126	252	504	756	1008	1260	1512	1764
15	67 $\frac{1}{2}$	135	270	540	810	1080	1350	1620	1890
16	72	144	288	576	864	1152	1440	1728	2016
17	76 $\frac{1}{2}$	153	306	612	918	1224	1530	1836	2142
18	81	162	324	648	972	1296	1620	1944	2268
19	85 $\frac{1}{2}$	171	342	684	1026	1368	1710	2052	2394
20	90	180	360	720	1080	1440	1800	2160	2520
21	94 $\frac{1}{2}$	189	378	756	1134	1512	1890	2268	2646
22	99	198	396	792	1188	1588	1980	2376	2772
23	103 $\frac{1}{2}$	207	414	828	1242	1656	2070	2484	2898
24	108	216	432	864	1296	1728	2160	2592	3024
25	112 $\frac{1}{2}$	225	450	900	1350	1800	2250	2700	3150
26	117	234	468	936	1404	1872	2340	2808	3276
27	121 $\frac{1}{2}$	243	486	972	1458	1944	2430	2916	3402
28	126	252	504	1008	1512	2016	2520	3024	3528
29	130 $\frac{1}{2}$	261	522	1044	1566	2088	2610	3132	3654
30	135	270	540	1080	1620	2160	2700	3240	3780
31	139 $\frac{1}{2}$	279	558	1116	1674	2232	2790	3348	3906
32	144	288	576	1152	1728	2304	2880	3456	4032
33	148 $\frac{1}{2}$	297	596	1188	1782	2376	2970	3564	4158
34	153	306	612	1224	1836	2448	3060	3672	4284
35	157 $\frac{1}{2}$	315	630	1260	1890	2520	3150	3780	4410
36	162	324	648	1296	1944	2592	3240	3888	4536
37	166 $\frac{1}{2}$	333	666	1332	1998	2664	3330	3996	4662
38	171	342	684	1368	2052	2736	3420	4104	4788
39	175 $\frac{1}{2}$	351	702	1404	2106	2808	3510	4212	4914
40	180	360	720	1440	2160	2880	3600	4320	5040
41	184 $\frac{1}{2}$	369	738	1476	2214	2952	3690	4428	5166
42	189	378	756	1512	2268	3024	3780	4536	5292
43	193 $\frac{1}{2}$	387	774	1548	2322	3096	3870	4644	5418
44	198	396	792	1584	2376	3168	3960	4752	5544
45	202 $\frac{1}{2}$	405	810	1620	2430	3240	4050	4860	5670
46	207	414	828	1656	2484	3312	4140	4968	5796
47	211 $\frac{1}{2}$	423	846	1692	2538	3384	4230	5076	5922
48	216	432	864	1728	2592	3456	4320	5184	6048
49	220 $\frac{1}{2}$	441	882	1764	2646	3528	4410	5292	6174
50	225	450	900	1800	2700	3600	4500	5400	6300

TABLE II. *continued.*

CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 18 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	162	180	198	216	234	252	270	288	306	324
2	324	360	396	432	468	504	540	576	612	648
3	486	540	594	648	702	756	810	864	918	972
4	648	720	792	864	936	1008	1080	1152	1224	1296
5	810	900	990	1080	1170	1260	1350	1440	1530	1620
6	972	1080	1188	1296	1404	1512	1620	1728	1836	1944
7	1134	1260	1386	1512	1638	1764	1890	2016	2142	2268
8	1296	1440	1584	1728	1872	2016	2160	2304	2448	2592
9	1458	1620	1782	1944	2106	2268	2430	2592	2754	2916
10	1620	1800	1980	2160	2340	2520	2700	2880	3060	3240
11	1780	1980	2178	2376	2574	2772	2970	3168	3366	3564
12	1944	2160	2376	2592	2808	3024	3240	3456	3672	3888
13	2106	2340	2574	2808	3042	3276	3510	3744	3978	4212
14	2268	2520	2772	3024	3276	3528	3780	4032	4284	4536
15	2430	2700	2970	3240	3510	3780	4050	4320	4590	4860
16	2592	2880	3168	3456	3744	4032	4320	4608	4896	5184
17	2754	3060	3366	3672	3978	4284	4590	4896	5202	5508
18	2916	3240	3564	3888	4204	4536	4860	5184	5508	5832
19	3078	3420	3762	4104	4446	4788	5130	5472	5814	6156
20	3240	3600	3960	4320	4680	5040	5400	5760	6120	6480
21	3402	3780	4158	4536	4914	5292	5670	6048	6426	6804
22	3564	3960	4356	4752	5148	5544	5940	6336	6732	7128
23	3726	4140	4554	4968	5382	5796	6210	6624	7038	7452
24	3888	4320	4752	5184	5616	6048	6480	6912	7344	7776
25	4050	4500	4950	5400	5850	6300	6750	7200	7650	8100
26	4212	4680	5148	5616	6084	6552	7020	7488	7956	8424
27	4374	4860	5346	5832	6318	6804	7290	7776	8262	8748
28	4536	5040	5544	6048	6552	7056	7560	8064	8568	9072
29	4698	5220	5742	6264	6786	7308	7830	8352	8874	9396
30	4860	5400	5940	6480	7020	7560	8100	8640	9180	9720
31	5022	5580	6138	6696	7254	7812	8370	8928	9486	10044
32	5184	5760	6336	6912	7488	8064	8640	9216	9792	10368
33	5346	5940	6534	7128	7722	8316	8910	9504	10098	10692
34	5508	6120	6732	7344	7956	8568	9180	9792	10404	11016
35	5670	6300	6930	7560	8190	8820	9450	10080	10710	11340
36	5832	6480	7128	7776	8424	9072	9720	10368	11016	11664
37	5994	6660	7326	7992	8658	9324	9990	10656	11322	11988
38	6156	6840	7524	8208	8892	9576	10260	10944	11628	12312
39	6318	7020	7722	8424	9126	9828	10530	11232	11934	12636
40	6480	7200	7920	8640	9360	10080	10800	11520	12240	12960
41	6642	7380	8118	8856	9594	10332	11070	11808	12546	13284
42	6804	7560	8316	9072	9828	10584	11340	12096	12852	13608
43	6966	7740	8514	9288	10062	10836	11610	12384	13158	13932
44	7128	7920	8712	9504	10296	11088	11880	12672	13464	14256
45	7290	8100	8910	9720	10530	11340	12150	12960	13770	14580
46	7452	8280	9108	9936	10764	11592	12420	13248	14076	14904
47	7614	8460	9306	10152	10998	11844	12690	13536	14382	15228
48	7776	8640	9504	10368	11232	12096	12960	13824	14688	15552
49	7938	8820	9702	10584	11466	12348	13230	14112	14994	15876
50	8100	9000	9900	10800	11700	12600	13500	14400	15300	16200

TABLE II. *continued.*

CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 19 feet.

Length.	Height.									8
	$\frac{1}{2}$ ft.	$\frac{3}{4}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	
1	4 $\frac{1}{2}$	9 $\frac{1}{2}$	19	38	57	76	95	114	133	1
2	9 $\frac{1}{2}$	19	38	76	114	152	190	228	266	2
3	14 $\frac{1}{2}$	28 $\frac{1}{2}$	57	114	171	228	285	342	399	3
4	19	38	76	152	228	304	380	456	532	4
5	23 $\frac{1}{2}$	47 $\frac{1}{2}$	95	190	285	380	475	570	665	5
6	28 $\frac{1}{2}$	57	114	228	342	456	570	684	798	6
7	33 $\frac{1}{2}$	66 $\frac{1}{2}$	133	266	399	532	665	798	931	7
8	38	76	152	304	456	608	760	912	1064	8
9	42 $\frac{1}{2}$	85 $\frac{1}{2}$	171	342	513	684	855	1026	1197	9
10	47 $\frac{1}{2}$	95	190	380	570	760	950	1140	1330	10
11	52 $\frac{1}{2}$	104 $\frac{1}{2}$	209	418	627	836	1045	1254	1463	11
12	57	114	228	456	684	912	1140	1368	1596	12
13	61 $\frac{1}{2}$	123 $\frac{1}{2}$	247	494	741	988	1235	1482	1729	13
14	66 $\frac{1}{2}$	133	266	532	798	1064	1330	1596	1862	14
15	71 $\frac{1}{2}$	142 $\frac{1}{2}$	285	570	855	1140	1425	1710	1995	15
16	76	152	304	608	912	1216	1520	1824	2128	16
17	80 $\frac{1}{2}$	161 $\frac{1}{2}$	323	646	969	1292	1615	1938	2261	17
18	85 $\frac{1}{2}$	171	342	684	1026	1368	1710	2052	2394	18
19	90 $\frac{1}{2}$	180 $\frac{1}{2}$	361	722	1083	1444	1805	2166	2527	19
20	95	190	380	760	1140	1520	1900	2280	2660	20
21	99 $\frac{1}{2}$	199 $\frac{1}{2}$	399	798	1197	1596	1995	2394	2793	21
22	104 $\frac{1}{2}$	209	418	836	1254	1672	2090	2508	2926	22
23	109 $\frac{1}{2}$	218 $\frac{1}{2}$	437	874	1311	1748	2185	2622	3059	23
24	114	228	456	912	1368	1824	2280	2736	3192	24
25	118 $\frac{1}{2}$	237 $\frac{1}{2}$	475	950	1425	1900	2375	2850	3325	25
26	123 $\frac{1}{2}$	247	494	988	1482	1976	2470	2964	3458	26
27	128 $\frac{1}{2}$	256 $\frac{1}{2}$	513	1026	1539	2052	2565	3078	3591	27
28	133	266	532	1064	1596	2128	2660	3192	3724	28
29	137 $\frac{1}{2}$	275 $\frac{1}{2}$	551	1102	1653	2204	2755	3306	3857	29
30	142 $\frac{1}{2}$	285	570	1140	1710	2280	2850	3420	3990	30
31	147 $\frac{1}{2}$	294 $\frac{1}{2}$	589	1178	1767	2356	2945	3534	4123	31
32	152	304	608	1216	1824	2432	3040	3648	4256	32
33	156 $\frac{1}{2}$	313 $\frac{1}{2}$	627	1254	1881	2508	3135	3762	4389	33
34	161 $\frac{1}{2}$	323	646	1292	1938	2584	3230	3876	4522	34
35	166 $\frac{1}{2}$	332 $\frac{1}{2}$	665	1330	1995	2660	3325	3990	4655	35
36	171	342	684	1368	2052	2736	3420	4104	4788	36
37	175 $\frac{1}{2}$	351 $\frac{1}{2}$	703	1406	2109	2812	3515	4218	4921	37
38	180 $\frac{1}{2}$	361	722	1444	2166	2888	3610	4332	5054	38
39	185 $\frac{1}{2}$	370 $\frac{1}{2}$	741	1482	2223	2964	3705	4446	5187	39
40	190	380	760	1520	2280	3040	3800	4560	5320	40
41	194 $\frac{1}{2}$	389 $\frac{1}{2}$	779	1558	2337	3116	3895	4674	5453	41
42	199 $\frac{1}{2}$	399	798	1596	2394	3192	3990	4788	5586	42
43	204 $\frac{1}{2}$	408 $\frac{1}{2}$	817	1634	2451	3268	4085	4902	5719	43
44	209	418	836	1672	2508	3344	4180	5016	5852	44
45	213 $\frac{1}{2}$	427 $\frac{1}{2}$	855	1710	2565	3420	4275	5130	5985	45
46	218 $\frac{1}{2}$	437	874	1748	2622	3496	4370	5244	6118	46
47	223 $\frac{1}{2}$	446 $\frac{1}{2}$	893	1786	2679	3572	4465	5358	6251	47
48	228	456	912	1824	2736	3648	4560	5472	6384	48
49	232 $\frac{1}{2}$	465 $\frac{1}{2}$	931	1862	2793	3724	4655	5586	6517	49
50	237 $\frac{1}{2}$	475	950	1900	2850	3800	4750	5700	6650	50

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 19 feet.

Height.									
9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
171	190	209	228	247	266	285	304	323	342
342	380	418	456	494	532	570	608	646	684
513	570	627	684	741	798	855	912	969	1026
684	760	836	912	988	1064	1140	1216	1292	1368
855	950	1045	1140	1235	1330	1425	1520	1615	1710
1026	1140	1254	1368	1482	1596	1710	1824	1938	2052
1197	1330	1463	1596	1729	1862	1995	2128	2261	2394
1368	1520	1672	1824	1976	2128	2280	2432	2584	2736
1539	1710	1881	2052	2223	2394	2565	2736	2907	3078
1710	1900	2090	2280	2470	2660	2850	3040	3230	3420
1881	2090	2299	2508	2717	2926	3135	3344	3553	3762
2052	2280	2508	2736	2964	3192	3420	3648	3876	4104
2223	2470	2717	2964	3211	3458	3705	3952	4199	4446
2394	2660	2926	3192	3458	3724	3990	4256	4522	4788
2565	2850	3135	3420	3705	3990	4275	4560	4845	5130
2736	3040	3344	3648	3952	4256	4560	4864	5168	5472
2907	3230	3553	3876	4199	4522	4845	5168	5491	5814
3078	3420	3762	4104	4446	4788	5130	5472	5814	6156
3249	3610	3971	4332	4693	5054	5415	5776	6137	6498
3420	3800	4180	4560	4940	5320	5700	6080	6460	6840
3591	3990	4389	4788	5187	5586	5985	6384	6783	7182
3762	4180	4598	5016	5434	5852	6270	6688	7106	7524
3933	4370	4807	5244	5681	6118	6555	6992	7429	7866
4104	4560	5016	5472	5928	6384	6840	7296	7752	8208
4275	4750	5225	5700	6175	6650	7125	7600	8075	8550
4446	4940	5434	5928	6422	6916	7410	7904	8398	8892
4617	5130	5643	6156	6669	7182	7695	8208	8721	9234
4788	5320	5852	6384	6916	7448	7980	8512	9044	9576
4959	5510	6061	6612	7163	7714	8265	8816	9367	9918
5130	5700	6270	6840	7410	7980	8550	9120	9690	10260
5301	5890	6479	7068	7657	8246	8835	9424	10013	10602
5472	6080	6688	7296	7904	8512	9120	9728	10336	10944
5643	6270	6897	7524	8151	8778	9405	10032	10659	11286
5814	6460	7106	7752	8398	9044	9690	10336	10982	11628
5985	6650	7315	7980	8645	9310	9975	10640	11305	11970
6156	6840	7524	8208	8892	9576	10260	10944	11628	12312
6327	7030	7733	8436	9139	9842	10545	11248	11951	12654
6498	7220	7942	8664	9386	10108	10830	11552	12274	12996
6669	7410	8151	8892	9633	10374	11115	11856	12597	13338
6840	7600	8360	9120	9880	10640	11400	12160	12920	13680
7011	7790	8569	9348	10127	10906	11685	12464	13243	14022
7182	7980	8778	9576	10374	11172	11970	12768	13566	14364
7353	8170	8987	9804	10621	11438	12255	13072	13889	14706
7524	8360	9196	10032	10868	11704	12540	13376	14212	15048
7695	8550	9405	10260	11115	11970	12825	13680	14535	15390
7866	8740	9614	10488	11362	12236	13110	13984	14858	15732
8037	8930	9823	10716	11609	12502	13395	14288	15181	16074
8208	9120	10032	10944	11856	12768	13680	14592	15504	16416
8379	9310	10241	11172	12103	13034	13965	14896	15827	16758
8550	9500	10450	11400	12350	13300	14250	15200	16150	17100

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 20 feet.

Length.	Height.								
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.
1	5	10	20	40	60	80	100	120	140
2	10	20	40	80	120	160	200	240	280
3	15	30	60	120	180	240	300	360	420
4	20	40	80	160	240	320	400	480	560
5	25	50	100	200	300	400	500	600	700
6	30	60	120	240	360	480	600	720	840
7	35	70	140	280	420	560	700	840	980
8	40	80	160	320	480	640	800	960	1120
9	45	90	180	360	540	720	900	1080	1260
10	50	100	200	400	600	800	1000	1200	1400
11	55	110	220	440	660	880	1100	1320	1540
12	60	120	240	480	720	960	1200	1440	1680
13	65	130	260	520	780	1040	1300	1560	1820
14	70	140	280	560	840	1120	1400	1680	1960
15	75	150	300	600	900	1200	1500	1800	2100
16	80	160	320	640	960	1280	1600	1920	2240
17	85	170	340	680	1020	1360	1700	2040	2380
18	90	180	360	720	1080	1440	1800	2160	2520
19	95	190	380	760	1140	1520	1900	2280	2660
20	100	200	400	800	1200	1600	2000	2400	2800
21	105	210	420	840	1260	1680	2100	2520	2940
22	110	220	440	880	1320	1760	2200	2640	3080
23	115	230	460	920	1380	1840	2300	2760	3220
24	120	240	480	960	1440	1920	2400	2880	3360
25	125	250	500	1000	1500	2000	2500	3000	3500
26	130	260	520	1040	1560	2080	2600	3120	3640
27	135	270	540	1080	1620	2160	2700	3240	3780
28	140	280	560	1120	1680	2240	2800	3360	3920
29	145	290	580	1160	1740	2320	2900	3480	4060
30	150	300	600	1200	1800	2400	3000	3600	4200
31	155	310	620	1240	1860	2480	3100	3720	4340
32	160	320	640	1280	1920	2560	3200	3840	4480
33	165	330	660	1320	1980	2640	3300	3960	4620
34	170	340	680	1360	2040	2720	3400	4080	4760
35	175	350	700	1400	2100	2800	3500	4200	4900
36	180	360	720	1440	2160	2880	3600	4320	5040
37	185	370	740	1480	2220	2960	3700	4440	5180
38	190	380	760	1520	2280	3040	3800	4560	5320
39	195	390	780	1560	2340	3120	3900	4680	5460
40	200	400	800	1600	2400	3200	4000	4800	5600
41	205	410	820	1640	2460	3280	4100	4920	5740
42	210	420	840	1680	2520	3360	4200	5040	5880
43	215	430	860	1720	2580	3440	4300	5160	6020
44	220	440	880	1760	2640	3520	4400	5280	6160
45	225	450	900	1800	2700	3600	4500	5400	6300
46	230	460	920	1840	2760	3680	4600	5520	6440
47	235	470	940	1880	2820	3760	4700	5640	6580
48	240	480	960	1920	2880	3840	4800	5760	6720
49	245	490	980	1960	2940	3920	4900	5880	6860
50	250	500	1000	2000	3000	4000	5000	6000	7000

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 20 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	180	200	220	240	260	280	300	320	340	360
2	360	400	440	480	520	560	600	640	680	720
3	540	600	660	720	780	840	900	960	1020	1080
4	720	800	880	960	1040	1120	1200	1280	1360	1440
5	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
6	1080	1200	1320	1440	1560	1680	1800	1920	2040	2160
7	1260	1400	1540	1680	1820	1960	2100	2240	2380	2520
8	1440	1600	1760	1920	2080	2240	2400	2560	2720	2880
9	1620	1800	1980	2160	2340	2520	2700	2880	3060	3240
10	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600
11	1980	2200	2420	2640	2860	3080	3300	3520	3740	3960
12	2160	2400	2640	2880	3120	3360	3600	3840	4080	4320
13	2340	2600	2860	3120	3380	3640	3900	4160	4420	4680
14	2520	2800	3080	3360	3640	3920	4200	4480	4760	5040
15	2700	3000	3300	3600	3900	4200	4500	4800	5100	5400
16	2880	3200	3520	3840	4160	4480	4800	5120	5440	5760
17	3060	3400	3740	4080	4420	4760	5100	5440	5780	6120
18	3240	3600	3960	4320	4680	5040	5400	5760	6120	6480
19	3420	3800	4180	4560	4940	5320	5700	6080	6460	6840
20	3600	4000	4400	4800	5200	5600	6000	6400	6800	7200
21	3780	4200	4620	5040	5460	5880	6300	6720	7140	7560
22	3960	4400	4840	5280	5720	6160	6600	7040	7480	7920
23	4140	4600	5060	5520	5980	6440	6900	7360	7820	8280
24	4320	4800	5280	5760	6240	6720	7200	7680	8160	8640
25	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000
26	4680	5200	5720	6240	6760	7280	7800	8320	8840	9360
27	4860	5400	5940	6480	7020	7560	8100	8640	9180	9720
28	5040	5600	6160	6720	7280	7840	8400	8960	9520	10080
29	5220	5800	6380	6960	7540	8120	8700	9280	9860	10440
30	5400	6000	6600	7200	7800	8400	9000	9600	10200	10800
31	5580	6200	6820	7440	8060	8680	9300	9920	10540	11160
32	5760	6400	7040	7680	8320	8960	9600	10240	10880	11520
33	5940	6600	7260	7920	8580	9240	9900	10560	11220	11880
34	6120	6800	7480	8160	8840	9520	10200	10880	11560	12240
35	6300	7000	7700	8400	9100	9800	10500	11200	11900	12600
36	6480	7200	7920	8640	9360	10080	10800	11520	12240	12960
37	6660	7400	8140	8880	9620	10360	11100	11840	12580	13320
38	6840	7600	8360	9120	9880	10640	11400	12160	12920	13680
39	7020	7800	8580	9360	10140	10920	11700	12480	13260	14040
40	7200	8000	8800	9600	10400	11200	12000	12800	13600	14400
41	7380	8200	9020	9840	10660	11480	12300	13120	13940	14760
42	7560	8400	9240	10080	10920	11760	12600	13440	14280	15120
43	7740	8600	9460	10320	11180	12040	12900	13760	14620	15480
44	7920	8800	9680	10560	11440	12320	13200	14080	14960	15840
45	8100	9000	9900	10800	11700	12600	13500	14400	15300	16200
46	8280	9200	10120	11040	11960	12880	13800	14720	15640	16560
47	8460	9400	10340	11280	12220	13160	14100	15040	15980	16920
48	8640	9600	10560	11520	12480	13440	14400	15360	16320	17280
49	8820	9800	10780	11760	12740	13720	14700	15680	16660	17640
50	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 21 feet.

Length.	Height.									
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	$5\frac{1}{4}$	$10\frac{1}{2}$	21	42	63	84	105	126	147	168
2	$10\frac{1}{2}$	21	42	84	126	168	210	252	294	336
3	$15\frac{1}{2}$	$31\frac{1}{2}$	63	126	189	252	315	378	441	504
4	$21\frac{1}{2}$	42	84	168	252	336	420	504	588	672
5	$26\frac{1}{2}$	$52\frac{1}{2}$	105	210	315	420	525	630	735	840
6	$31\frac{1}{2}$	63	126	252	378	504	630	756	882	1008
7	$36\frac{1}{2}$	$73\frac{1}{2}$	147	294	441	588	735	882	1029	1176
8	42	84	168	336	504	672	840	1008	1176	1344
9	$47\frac{1}{2}$	$94\frac{1}{2}$	189	378	567	756	945	1134	1323	1512
10	52	95	210	420	630	840	1050	1260	1470	1680
11	$57\frac{1}{2}$	$115\frac{1}{2}$	231	462	693	924	1155	1386	1617	1848
12	63	126	252	504	756	1008	1260	1512	1764	2016
13	$68\frac{1}{2}$	$136\frac{1}{2}$	273	546	819	1092	1365	1638	1911	2184
14	$73\frac{1}{2}$	147	294	588	882	1176	1470	1764	2058	2352
15	$78\frac{1}{2}$	$157\frac{1}{2}$	315	630	945	1260	1575	1890	2205	2520
16	84	168	336	672	1008	1344	1680	2016	2352	2688
17	$89\frac{1}{2}$	$178\frac{1}{2}$	357	714	1071	1428	1785	2142	2499	2856
18	94	189	378	756	1134	1512	1890	2268	2646	3024
19	$99\frac{1}{2}$	$199\frac{1}{2}$	399	788	1197	1596	1995	2394	2793	3192
20	105	210	420	840	1260	1680	2100	2520	2940	3360
21	$110\frac{1}{2}$	$220\frac{1}{2}$	441	882	1323	1764	2205	2646	3087	3528
22	$115\frac{1}{2}$	231	462	924	1386	1848	2310	2772	3234	3696
23	$120\frac{1}{2}$	$241\frac{1}{2}$	483	966	1449	1932	2415	2896	3381	3864
24	126	252	504	1008	1512	2016	2520	2924	3528	4032
25	$131\frac{1}{2}$	$262\frac{1}{2}$	525	1050	1575	2100	2625	3050	3675	4200
26	$136\frac{1}{2}$	273	546	1092	1638	2184	2730	3176	3822	4368
27	141	$283\frac{1}{2}$	567	1134	1701	2268	2835	3302	3969	4536
28	147	294	588	1176	1764	2352	2940	3428	4116	4704
29	$152\frac{1}{2}$	$304\frac{1}{2}$	609	1218	1827	2436	3045	3554	4263	4872
30	157	315	630	1260	1890	2520	3150	3780	4410	5040
31	162	$325\frac{1}{2}$	651	1302	1953	2604	3255	3906	4557	5208
32	168	336	672	1344	2016	2688	3360	4032	4704	5376
33	$173\frac{1}{2}$	$346\frac{1}{2}$	693	1386	2079	2772	3465	4158	4851	5544
34	178	357	714	1428	2142	2856	3570	4284	4998	5712
35	$183\frac{1}{2}$	$367\frac{1}{2}$	735	1470	2205	2940	3675	4410	5145	5880
36	189	378	756	1512	2268	3024	3780	4536	5292	6048
37	$194\frac{1}{2}$	$388\frac{1}{2}$	777	1554	2331	3108	3885	4662	5439	6216
38	199	399	798	1596	2394	3192	3990	4788	5586	6384
39	$204\frac{1}{2}$	$409\frac{1}{2}$	819	1638	2457	3276	4095	4914	5733	6552
40	210	420	840	1680	2520	3360	4200	5040	5880	6720
41	$215\frac{1}{2}$	$430\frac{1}{2}$	861	1722	2583	3444	4305	5166	6027	6888
42	220	441	882	1764	2646	3528	4410	5292	6174	7056
43	$225\frac{1}{2}$	$451\frac{1}{2}$	903	1806	2709	3612	4515	5418	6321	7224
44	231	462	924	1848	2772	3696	4620	5544	6468	7392
45	$236\frac{1}{2}$	$472\frac{1}{2}$	945	1890	2835	3780	4725	5670	6615	7560
46	241	483	966	1932	2898	3864	4830	5796	6762	7728
47	$246\frac{1}{2}$	$493\frac{1}{2}$	987	1974	2961	3948	4935	5922	6909	7896
48	252	504	1008	2016	3024	4032	5040	6048	7056	8064
49	$257\frac{1}{2}$	$514\frac{1}{2}$	1029	2058	3087	4116	5145	6174	7203	8232
50	262	525	1050	2100	3150	4200	5250	6300	7350	8400

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 21 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	189	210	231	252	273	294	315	336	357	378
2	378	420	462	504	546	588	630	672	714	756
3	567	630	693	756	819	882	945	1008	1071	1134
4	756	840	924	1008	1092	1176	1260	1344	1428	1512
5	945	1050	1155	1260	1365	1470	1575	1680	1785	1890
6	1134	1260	1386	1512	1638	1764	1890	2016	2142	2268
7	1323	1470	1617	1764	1911	2048	2205	2352	2449	2646
8	1512	1680	1848	2016	2184	2352	2520	2688	2856	3024
9	1701	1890	2079	2268	2457	2646	2835	3024	3213	3402
10	1890	2100	2310	2520	2730	2940	3150	3360	3570	3780
11	2079	2310	2541	2772	3003	3234	3465	3696	3927	4158
12	2268	2520	2772	3024	3276	3528	3780	4032	4284	4536
13	2457	2730	3003	3276	3549	3822	4095	4368	4641	4914
14	2646	2940	3234	3528	3822	4116	4410	4704	4998	5292
15	2835	3150	3465	3780	4096	4410	4725	5040	5355	5670
16	3024	3360	3696	4032	4368	4704	5040	5376	5712	6048
17	3213	3570	3927	4284	4641	4998	5355	5712	6069	6426
18	3402	3780	4158	4536	4914	5292	5670	6048	6426	6804
19	3591	3990	4389	4788	5187	5586	5985	6384	6783	7182
20	3780	4200	4620	5040	5460	5880	6300	6720	7140	7560
21	3969	4410	4851	5292	5733	6174	6615	7056	7497	7938
22	4158	4620	5082	5544	6006	6468	6930	7392	7854	8316
23	4347	4830	5313	5796	6279	6762	7245	7728	8211	8694
24	4536	5040	5544	6048	6552	7056	7560	8064	8568	9072
25	4725	5250	5775	6300	6825	7350	7875	8400	8925	9450
26	4914	5460	6006	6552	7098	7644	8190	8736	9282	9828
27	5103	5670	6237	6804	7371	7938	8505	9072	9639	10206
28	5292	5880	6468	7056	7644	8232	8820	9408	9996	10584
29	5481	6090	6699	7308	7917	8526	9135	9744	10353	10962
30	5670	6300	6930	7560	8190	8820	9450	10180	10710	11340
31	5859	6510	7161	7812	8463	9114	9765	10516	11067	11718
32	6048	6720	7392	8064	8736	9408	10080	10852	11424	12096
33	6237	6930	7623	8316	9009	9702	10395	11188	11781	12474
34	6426	7140	7854	8568	9282	9996	10710	11524	12138	12852
35	6615	7350	8085	8820	9555	10290	11025	11860	12495	13230
36	6804	7560	8316	9072	9828	10584	11340	12196	12852	13608
37	6993	7770	8547	9324	10101	10878	11655	12532	13209	13986
38	7182	7980	8778	9576	10374	11172	11970	12868	13566	14364
39	7371	8190	9009	9828	10647	11466	12285	13204	13923	14742
40	7560	8400	9240	10080	10920	11760	12600	13540	14280	15120
41	7749	8610	9471	10332	11193	12054	12915	13876	14637	15498
42	7938	8820	9702	10584	11466	12348	13230	14212	14994	15876
43	8127	9030	9933	10836	11739	12642	13545	14548	15351	16254
44	8316	9240	10164	11088	12012	12936	13860	14884	15708	16632
45	8505	9450	10395	11340	12285	13230	14175	15220	16065	17010
46	8694	9660	10626	11592	12558	13524	14490	15556	16422	17388
47	8883	9870	10857	11844	12831	13818	14805	15892	16779	17766
48	9072	10080	11088	12096	13104	14112	15120	16228	17136	18144
49	9261	10290	11319	12348	13377	14406	15435	16564	17493	18522
50	9450	10500	11550	12600	13650	14700	15750	16800	17850	18900

TABLE II. *continued.*

CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 22 feet.

Length.	Height.							
	$\frac{1}{2}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	7 ft.
1	5 $\frac{1}{2}$	11	22	44	66	88	110	154
2	11	22	44	88	132	176	220	308
3	16 $\frac{1}{2}$	33	66	132	198	264	330	462
4	22	44	88	176	264	352	440	616
5	27 $\frac{1}{2}$	55	110	220	330	440	550	770
6	33	66	132	264	396	528	660	924
7	38 $\frac{1}{2}$	77	154	308	462	616	770	1078
8	44	88	176	352	528	704	880	1232
9	49 $\frac{1}{2}$	99	198	396	594	792	990	1386
10	55	110	220	440	660	880	1100	1540
11	60 $\frac{1}{2}$	121	242	484	726	968	1210	1694
12	66	132	264	528	792	1056	1320	1848
13	71 $\frac{1}{2}$	143	286	572	858	1144	1430	2002
14	77	154	308	616	924	1232	1540	2156
15	82 $\frac{1}{2}$	165	330	660	990	1320	1650	2310
16	88	176	352	704	1056	1408	1760	2464
17	93 $\frac{1}{2}$	187	374	748	1122	1496	1870	2618
18	99	198	396	792	1188	1584	1980	2772
19	104 $\frac{1}{2}$	209	418	836	1254	1672	2090	2926
20	110	220	440	880	1320	1760	2200	3080
21	115 $\frac{1}{2}$	231	462	924	1386	1848	2310	3234
22	121	242	484	968	1452	1936	2420	3388
23	126 $\frac{1}{2}$	253	506	1012	1518	2024	2530	3542
24	132	264	528	1056	1584	2112	2640	3696
25	137 $\frac{1}{2}$	275	550	1100	1650	2200	2750	3850
26	143	286	572	1144	1716	2288	2860	4004
27	148 $\frac{1}{2}$	297	594	1188	1782	2376	2970	4158
28	154	308	616	1232	1848	2464	3080	4312
29	159 $\frac{1}{2}$	319	638	1276	1914	2552	3190	4466
30	165	330	660	1320	1980	2640	3300	4620
31	170 $\frac{1}{2}$	341	682	1364	2046	2728	3410	4774
32	176	352	704	1408	2112	2816	3520	4928
33	181 $\frac{1}{2}$	363	726	1452	2178	2904	3630	5082
34	187	374	748	1496	2244	2992	3740	5236
35	192 $\frac{1}{2}$	385	770	1540	2310	3080	3850	5390
36	198	396	792	1584	2376	3168	3960	5544
37	203 $\frac{1}{2}$	407	814	1628	2442	3256	4070	5698
38	209	418	836	1672	2508	3344	4180	5852
39	214 $\frac{1}{2}$	429	858	1716	2574	3432	4290	6006
40	220	440	880	1760	2640	3520	4400	6160
41	225 $\frac{1}{2}$	451	902	1804	2706	3608	4510	6314
42	231	462	924	1848	2772	3696	4620	6468
43	236 $\frac{1}{2}$	473	946	1892	2838	3784	4730	6622
44	242	484	968	1936	2904	3872	4840	6776
45	247 $\frac{1}{2}$	495	990	1980	2970	3960	4950	6930
46	253	506	1012	2024	3036	4048	5060	7084
47	258 $\frac{1}{2}$	517	1034	2068	3102	4136	5170	7238
48	264	528	1056	2112	3168	4224	5280	7392
49	269 $\frac{1}{2}$	539	1078	2156	3234	4312	5390	7546
--	275	550	1100	2200	3300	4400	5500	7700

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 22 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	198	220	242	264	286	308	330	352	374	396
2	396	440	484	528	572	616	660	704	748	792
3	594	660	726	792	858	924	990	1056	1122	1188
4	792	880	968	1056	1144	1232	1320	1408	1496	1584
5	990	1100	1210	1320	1430	1540	1650	1760	1870	1980
6	1188	1320	1452	1584	1716	1848	1980	2112	2244	2376
7	1386	1540	1694	1848	2002	2156	2310	2464	2618	2772
8	1584	1760	1936	2112	2288	2464	2640	2816	2992	3168
9	1782	1980	2178	2376	2574	2772	2970	3168	3366	3564
10	1980	2200	2420	2640	2860	3080	3300	3520	3740	3960
11	2178	2420	2662	2904	3146	3388	3630	3872	4114	4356
12	2376	2640	2904	3168	3432	3696	3960	4224	4488	4752
13	2574	2860	3146	3432	3718	4004	4290	4576	4862	5148
14	2772	3080	3388	3696	4004	4312	4620	4928	5236	5544
15	2970	3300	3630	3960	4290	4620	4950	5280	5610	5940
16	3168	3520	3872	4224	4576	4928	5280	5632	5984	6336
17	3366	3740	4114	4488	4862	5236	5610	5984	6358	6732
18	3564	3960	4356	4752	5148	5544	5940	6336	6732	7128
19	3762	4180	4598	5016	5434	5852	6270	6688	7106	7524
20	3960	4400	4840	5280	5720	6160	6600	7040	7480	7920
21	4158	4620	5082	5544	6006	6468	6930	7392	7854	8316
22	4356	4840	5324	5808	6292	6776	7260	7744	8228	8712
23	4554	5060	5566	6072	6578	7084	7590	8096	8602	9108
24	4752	5280	5808	6336	6864	7392	7920	8448	8971	9504
25	4950	5500	6050	6600	7150	7700	8250	8800	9350	9900
26	5148	5720	6292	6864	7436	8008	8580	9152	9724	10296
27	5346	5940	6534	7128	7722	8316	8910	9504	10098	10692
28	5544	6160	6776	7392	8008	8624	9240	9856	10472	11088
29	5742	6380	7018	7656	8294	8932	9570	10208	10846	11484
30	5940	6600	7260	7920	8580	9240	9900	10560	11220	11880
31	6138	6820	7502	8184	8866	9548	10230	10912	11594	12276
32	6336	7040	7744	8448	9152	9856	10560	11264	11968	12672
33	6534	7260	7986	8712	9438	10164	10890	11616	12342	13068
34	6732	7480	8228	8976	9724	10472	11220	11968	12716	13464
35	6930	7700	8470	9240	10010	10780	11550	12320	13090	13860
36	7128	7920	8712	9504	10296	11088	11880	12672	13464	14256
37	7326	8140	8954	9768	10582	11396	12210	13024	13838	14652
38	7524	8360	9196	10032	10868	11704	12540	13376	14212	15048
39	7722	8580	9438	10296	11154	12012	12870	13728	14586	15444
40	7920	8800	9680	10560	11440	12320	13200	14080	14960	15840
41	8118	9020	9922	10824	11726	12628	13530	14432	15334	16236
42	8316	9240	10164	11088	12012	12936	13860	14784	15708	16632
43	8514	9460	10406	11352	12298	13244	14190	15136	16082	17028
44	8712	9680	10648	11616	12584	13552	14520	15488	16456	17424
45	8910	9900	10890	11880	12870	13860	14850	15840	16830	17820
46	9108	10120	11132	12144	13166	14188	15180	16192	17204	18216
47	9306	10340	11374	12408	13442	14476	15510	16544	17578	18612
48	9504	10560	11616	12672	13728	14784	15840	16896	17952	19008
49	9702	10780	11858	12936	14024	15092	16170	17248	18326	19404
50	9900	11000	12100	13200	14300	15400	16500	17600	18700	19800

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 23 feet.

Length.	Height.									
	$\frac{1}{2}$ ft.	$\frac{3}{4}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	5 $\frac{1}{2}$	11 $\frac{1}{2}$	23	46	69	92	115	138	161	184
2	11 $\frac{1}{2}$	23	46	92	138	184	230	276	322	368
3	17 $\frac{1}{2}$	34 $\frac{1}{2}$	69	138	207	276	345	414	483	552
4	23	46	92	184	276	368	460	552	644	736
5	28 $\frac{1}{2}$	57 $\frac{1}{2}$	115	230	345	460	575	690	805	920
6	34 $\frac{1}{2}$	69	138	276	414	552	690	828	966	1104
7	40 $\frac{1}{2}$	80 $\frac{1}{2}$	161	322	483	644	805	966	1127	1288
8	46	92	184	368	552	736	920	1104	1288	1472
9	51 $\frac{1}{2}$	103 $\frac{1}{2}$	207	414	621	828	1035	1242	1449	1656
10	57 $\frac{1}{2}$	115	230	460	690	920	1150	1380	1610	1840
11	63 $\frac{1}{2}$	126 $\frac{1}{2}$	253	506	759	1012	1265	1518	1771	2024
12	69	138	276	552	828	1104	1380	1656	1932	2208
13	74 $\frac{1}{2}$	149 $\frac{1}{2}$	299	598	897	1196	1495	1794	2093	2392
14	80 $\frac{1}{2}$	161	322	644	966	1288	1610	1932	2254	2576
15	86 $\frac{1}{2}$	172 $\frac{1}{2}$	345	690	1035	1380	1725	2070	2415	2760
16	92	184	368	736	1104	1472	1840	2208	2576	2944
17	97 $\frac{1}{2}$	195 $\frac{1}{2}$	391	782	1173	1564	1955	2346	2737	3128
18	103 $\frac{1}{2}$	207	414	828	1242	1656	2070	2484	2898	3312
19	109 $\frac{1}{2}$	218 $\frac{1}{2}$	437	874	1311	1748	2185	2622	3059	3496
20	115	230	460	920	1380	1840	2300	2760	3220	3680
21	120 $\frac{1}{2}$	241 $\frac{1}{2}$	483	966	1449	1932	2415	2898	3381	3864
22	126 $\frac{1}{2}$	253	506	1012	1518	2024	2530	3036	3542	4048
23	132 $\frac{1}{2}$	264 $\frac{1}{2}$	529	1058	1587	2116	2645	3174	3703	4232
24	138	276	552	1104	1656	2208	2760	3312	3864	4416
25	143 $\frac{1}{2}$	287 $\frac{1}{2}$	575	1150	1725	2300	2875	3450	4025	4600
26	149 $\frac{1}{2}$	299	598	1196	1794	2392	2990	3588	4186	4784
27	155 $\frac{1}{2}$	310 $\frac{1}{2}$	621	1242	1863	2484	3105	3726	4347	4968
28	161	322	644	1288	1932	2576	3220	3864	4508	5152
29	166 $\frac{1}{2}$	333 $\frac{1}{2}$	667	1334	2001	2668	3335	4002	4669	5336
30	172 $\frac{1}{2}$	345	690	1380	2070	2760	3450	4140	4830	5520
31	178 $\frac{1}{2}$	356 $\frac{1}{2}$	713	1426	2139	2852	3565	4278	4991	5704
32	184	368	736	1472	2208	2944	3680	4416	5152	5888
33	189 $\frac{1}{2}$	379 $\frac{1}{2}$	759	1518	2277	3036	3795	4554	5313	6072
34	195 $\frac{1}{2}$	391	782	1564	2346	3128	3910	4692	5474	6256
35	201 $\frac{1}{2}$	402 $\frac{1}{2}$	805	1610	2415	3220	4025	4830	5635	6440
36	207	414	828	1656	2484	3312	4140	4968	5796	6624
37	212 $\frac{1}{2}$	425 $\frac{1}{2}$	851	1702	2553	3404	4255	5106	5957	6808
38	218 $\frac{1}{2}$	437	874	1748	2622	3496	4370	5244	6118	6992
39	224 $\frac{1}{2}$	448 $\frac{1}{2}$	897	1794	2691	3588	4485	5382	6279	7176
40	230	460	920	1840	2760	3680	4600	5520	6440	7360
41	235 $\frac{1}{2}$	471 $\frac{1}{2}$	943	1886	2829	3772	4715	5658	6601	7544
42	241 $\frac{1}{2}$	483	966	1932	2898	3864	4830	5796	6762	7728
43	247 $\frac{1}{2}$	494 $\frac{1}{2}$	989	1978	2967	3956	4945	5934	6923	7912
44	253	506	1012	2024	3036	4048	5060	6072	7084	8096
45	258 $\frac{1}{2}$	517 $\frac{1}{2}$	1035	2070	3105	4140	5175	6210	7245	8280
46	264 $\frac{1}{2}$	529	1058	2116	3174	4232	5290	6348	7406	8464
47	270 $\frac{1}{2}$	540 $\frac{1}{2}$	1081	2162	3243	4324	5405	6486	7567	8648
48	276	552	1104	2208	3312	4416	5520	6624	7728	8832
49	281 $\frac{1}{2}$	563 $\frac{1}{2}$	1127	2254	3381	4508	5635	6762	7889	9016
50	287 $\frac{1}{2}$	575	1150	2300	3450	4600	5750	6900	8050	9200

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.

Breadth, 23 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	207	230	253	276	299	322	345	368	391	414
2	414	460	506	552	598	644	690	736	782	828
3	621	690	759	828	897	966	1035	1104	1173	1242
4	828	920	1012	1104	1196	1288	1380	1472	1564	1656
5	1035	1150	1265	1380	1495	1610	1725	1840	1955	2070
6	1242	1380	1518	1656	1794	1932	2070	2208	2346	2484
7	1449	1610	1771	1932	2093	2254	2415	2576	2737	2898
8	1656	1840	2024	2208	2392	2576	2760	2944	3128	3312
9	1863	2070	2277	2484	2691	2898	3105	3312	3519	3726
10	2070	2300	2530	2760	2990	3220	3450	3680	3910	4140
11	2277	2530	2783	3036	3289	3542	3795	4048	4301	4554
12	2484	2760	3036	3312	3588	3864	4140	4416	4692	4968
13	2691	2990	3289	3588	3887	4186	4485	4784	5083	5382
14	2898	3220	3542	3864	4186	4508	4830	5152	5474	5796
15	3105	3450	3795	4140	4485	4830	5175	5520	5865	6210
16	3312	3680	4048	4416	4784	5152	5520	5888	6256	6624
17	3519	3910	4301	4692	5083	5474	5865	6256	6647	7038
18	3726	4140	4554	4968	5382	5796	6210	6624	7038	7452
19	3933	4370	4807	5244	5681	6118	6555	6992	7429	7866
20	4140	4600	5060	5520	5980	6440	6900	7360	7820	8280
21	4347	4830	5313	5796	6279	6762	7245	7728	8211	8694
22	4554	5060	5566	6072	6578	7084	7590	8096	8602	9108
23	4761	5290	5819	6348	6877	7406	7935	8464	8993	9522
24	4968	5520	6072	6624	7176	7728	8280	8832	9384	9936
25	5175	5750	6325	6900	7475	8050	8625	9200	9775	10350
26	5382	5980	6578	7176	7774	8372	8970	9568	10266	10764
27	5589	6210	6831	7452	8073	8694	9315	9936	10657	11178
28	5796	6440	7084	7728	8372	9016	9660	10304	11048	11592
29	6003	6670	7337	8004	8671	9338	10005	10672	11439	12006
30	6210	6900	7590	8280	8970	9660	10350	11040	11830	12420
31	6417	7130	7843	8556	9269	9982	10695	11408	12121	12834
32	6624	7360	8096	8832	9568	10304	11040	11776	12512	13248
33	6831	7590	8349	9108	9867	10626	11385	12144	12903	13662
34	7038	7820	8602	9384	10166	10948	11730	12512	13294	14076
35	7245	8050	8855	9660	10465	11270	12075	12880	13685	14490
36	7452	8280	9108	99. 6	10764	11592	12420	13248	14076	14904
37	7659	8510	9361	10212	11063	11914	12765	13616	14467	15318
38	7866	8740	9614	10488	11362	12236	13110	13984	14858	15732
39	8073	8970	9867	10764	11661	12558	13455	14352	15249	16146
40	8280	9200	10120	11040	11960	12880	13800	14720	15640	16560
41	8487	9430	10373	11316	12259	13202	14145	15088	16031	16974
42	8694	9660	10626	11592	12558	13524	14490	15456	16422	17388
43	8901	9890	10879	11868	12857	13846	14835	15824	16813	17802
44	9108	10120	11132	12144	13156	14168	15180	16192	17204	18216
45	9315	10350	11385	12420	13455	14490	15525	16560	17595	18630
46	9522	10580	11638	12696	13754	14812	15870	16928	17986	19044
47	9729	10810	11891	12972	14053	15134	16215	17296	18377	19458
48	9936	11040	12144	13248	14352	15456	16560	17664	18768	19872
49	10143	11270	12397	13524	14651	15778	16905	18032	19159	20286
50	10350	11500	12650	13800	14950	16100	17250	18400	19550	20700

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 24 feet.

Length.	Height.								
	$\frac{1}{2}$ ft.	$\frac{3}{4}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	8 ft.
1	6	12	24	48	72	96	120	144	192
2	12	24	48	96	144	192	240	288	384
3	18	36	72	144	216	288	360	432	576
4	24	48	96	192	288	384	480	576	768
5	30	60	120	240	360	480	600	720	960
6	36	72	144	288	432	576	720	864	1152
7	42	84	168	336	504	672	840	1008	1344
8	48	96	192	384	576	768	960	1152	1536
9	54	108	216	432	648	864	1080	1296	1728
10	60	120	240	480	720	960	1200	1440	1920
11	66	132	264	528	792	1056	1320	1584	2112
12	72	144	288	576	864	1152	1440	1728	2304
13	78	156	312	624	936	1248	1560	1872	2496
14	84	168	336	672	1008	1344	1680	2016	2688
15	90	180	360	720	1080	1440	1800	2160	2880
16	96	192	384	768	1152	1536	1920	2304	3072
17	102	204	408	816	1224	1632	2040	2448	3264
18	108	216	432	864	1296	1728	2160	2592	3456
19	114	228	456	912	1368	1824	2280	2736	3648
20	120	240	480	960	1440	1920	2400	2880	3840
21	126	252	504	1008	1512	2016	2520	3024	4032
22	132	264	528	1056	1584	2112	2640	3168	4224
23	138	276	552	1104	1656	2208	2760	3312	4416
24	144	288	576	1152	1728	2304	2880	3456	4608
25	150	300	600	1200	1810	2400	3000	3600	4800
26	156	312	624	1248	1872	2496	3120	3744	4992
27	162	324	648	1296	1944	2592	3240	3888	5184
28	168	336	672	1344	2016	2688	3360	4032	5376
29	174	348	696	1392	2088	2784	3480	4176	5568
30	180	360	720	1440	2160	2880	3600	4320	5760
31	186	372	744	1488	2232	2976	3720	4464	5952
32	192	384	768	1536	2304	3072	3840	4608	6144
33	198	396	792	1584	2376	3168	3960	4752	6336
34	204	408	816	1632	2448	3264	4080	4896	6528
35	210	420	840	1680	2520	3360	4200	5040	6720
36	216	432	864	1728	2592	3456	4320	5184	6912
37	222	444	888	1776	2664	3552	4440	5328	7104
38	228	456	912	1824	2736	3648	4560	5472	7296
39	234	468	936	1872	2808	3744	4680	5616	7488
40	240	480	960	1920	2880	3840	4800	5760	7680
41	246	492	984	1968	2952	3936	4920	5904	7872
42	252	504	1008	2016	3024	4032	5040	6048	8064
43	258	516	1032	2064	3096	4128	5160	6192	8256
44	264	528	1056	2112	3168	4224	5280	6336	8448
45	270	540	1080	2160	3240	4320	5400	6480	8640
46	276	552	1104	2208	3312	4416	5520	6624	8832
47	282	564	1128	2256	3384	4512	5640	6768	9024
48	288	576	1152	2304	3456	4608	5760	6912	9216
49	294	588	1176	2352	3528	4704	5880	7056	9408
50	300	600	1200	2400	3600	4800	6000	7200	9600

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 24 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	216	240	264	288	312	336	360	384	408	432
2	432	480	528	576	624	672	720	768	816	864
3	648	720	792	864	936	1008	1080	1152	1224	1296
4	864	960	1056	1152	1248	1344	1440	1536	1632	1728
5	1080	1200	1320	1440	1560	1680	1800	1920	2040	2160
6	1296	1440	1584	1728	1872	2016	2160	2304	2448	2592
7	1512	1680	1848	2016	2184	2352	2520	2688	2856	3024
8	1728	1920	2212	2304	2496	2688	2880	3072	3264	3456
9	1944	2160	2476	2592	2808	3024	3240	3456	3672	3888
10	2160	2400	2640	2880	3120	3360	3600	3840	4080	4320
11	2376	2640	2904	3168	3432	3696	3960	4224	4488	4752
12	2592	2880	3168	3456	3744	4032	4320	4608	4896	5184
13	2808	3120	3432	3744	4056	4368	4680	4992	5304	5616
14	3024	3360	3696	4032	4368	4794	5040	5376	5712	6048
15	3240	3600	3960	4320	4680	5040	5400	5760	6120	6480
16	3456	3840	4224	4608	4992	5376	5760	6144	6528	6912
17	3672	4080	4488	4896	5304	5712	6120	6528	6936	7344
18	3888	4320	4752	5184	5616	6048	6480	6912	7344	7776
19	4104	4560	5016	5472	5928	6384	6840	7296	7752	8208
20	4320	4800	5280	5760	6240	6720	7200	7680	8160	8640
21	4536	5040	5544	6048	6552	7056	7560	8064	8568	9072
22	4752	5280	5808	6336	6864	7392	7920	8448	8976	9504
23	4968	5520	6072	6624	7176	7728	8280	8832	9384	9936
24	5184	5760	6336	6912	7488	8064	8640	9216	9792	10368
25	5400	6000	6600	7200	7800	8400	9000	9600	10200	10800
26	5616	6240	6864	7488	8112	8736	9360	9984	10608	11232
27	5832	6480	7128	7776	8424	9072	9720	10368	11016	11664
28	6048	6720	7392	8064	8736	9408	10080	10752	11424	12096
29	6264	6960	7656	8352	9048	9744	10440	11136	11832	12528
30	6480	7200	7920	8640	9360	10080	10800	11520	12240	12960
31	6696	7440	8184	8928	9672	10416	11160	11904	12648	13392
32	6912	7680	8448	9216	9984	10752	11520	12288	13056	13824
33	7128	7920	8712	9504	10296	11088	11880	12672	13464	14256
34	7344	8160	8976	9792	10608	11424	12240	13056	13872	14688
35	7560	8400	9240	10080	10920	11760	12600	13440	14280	15120
36	7776	8640	9504	10368	11232	12096	12960	13824	14688	15552
37	7992	8880	9768	10656	11544	12432	13320	14208	15096	15984
38	8208	9120	10032	10944	11866	12768	13680	14592	15504	16416
39	8424	9360	10296	11232	12168	13104	14040	14976	15912	16848
40	8640	9600	10560	11520	12480	13440	14400	15360	16320	17280
41	8856	9840	10824	11808	12792	13776	14760	15744	16728	17712
42	9072	10080	11088	12096	13104	14112	15120	16128	17136	18144
43	9988	10320	11352	12384	13416	14448	15480	16512	17544	18576
44	9504	10560	11616	12672	13728	14784	15840	16896	17952	19008
45	9720	10800	11880	12960	14040	15120	16200	17280	18360	19440
46	9936	11040	12144	13248	14352	15456	16560	17664	18768	19872
47	10152	11280	12408	13536	14664	15792	16920	18048	19176	20304
48	10368	11520	12672	13824	14976	16128	17280	18432	19584	20736
49	10584	11760	12936	14112	15288	16464	17640	18816	19992	21168
50	10800	12000	13200	14400	15600	16800	18000	19200	20400	21600

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 25 feet.

Length.	Height.									
	$\frac{1}{4}$ ft.	$\frac{1}{2}$ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.
1	$6\frac{1}{4}$	$12\frac{1}{2}$	25	50	75	100	125	150	175	200
2	$12\frac{1}{2}$	25	50	100	150	200	250	300	350	400
3	$18\frac{3}{4}$	$37\frac{1}{2}$	75	150	225	300	375	450	525	600
4	25	50	100	200	300	400	500	600	700	800
5	$31\frac{1}{4}$	$62\frac{1}{2}$	125	250	375	500	625	750	875	1000
6	$37\frac{1}{2}$	75	150	300	450	600	750	900	1050	1200
7	$43\frac{3}{4}$	$87\frac{1}{2}$	175	350	525	700	875	1050	1225	1400
8	50	100	200	400	600	800	1000	1200	1400	1600
9	$56\frac{1}{4}$	$112\frac{1}{2}$	225	450	675	900	1125	1350	1575	1800
10	$62\frac{1}{2}$	125	250	500	750	1000	1250	1500	1750	2000
11	$68\frac{1}{4}$	$137\frac{1}{2}$	275	550	825	1100	1375	1650	1925	2200
12	75	150	300	600	900	1200	1500	1800	2100	2400
13	$81\frac{1}{4}$	$162\frac{1}{2}$	325	650	975	1300	1625	1950	2275	2600
14	$87\frac{1}{2}$	175	350	700	1050	1400	1750	2100	2450	2800
15	$93\frac{3}{4}$	$187\frac{1}{2}$	375	750	1125	1500	1875	2250	2625	3000
16	100	200	400	800	1200	1600	2000	2400	2800	3200
17	$106\frac{1}{4}$	$212\frac{1}{2}$	425	850	1275	1700	2125	2550	2975	3400
18	$112\frac{1}{2}$	225	450	900	1350	1800	2250	2700	3150	3600
19	$118\frac{3}{4}$	$237\frac{1}{2}$	475	950	1425	1900	2375	2850	3325	3800
20	125	250	500	1000	1500	2000	2500	3000	3500	4000
21	$131\frac{1}{4}$	$262\frac{1}{2}$	525	1050	1575	2100	2625	3150	3675	4200
22	$137\frac{1}{2}$	275	550	1100	1650	2200	2750	3300	3850	4400
23	$143\frac{3}{4}$	$287\frac{1}{2}$	575	1150	1725	2300	2875	3450	4025	4600
24	150	300	600	1200	1800	2400	3000	3600	4200	4800
25	$156\frac{1}{4}$	$312\frac{1}{2}$	625	1250	1875	2500	3125	3750	4375	5000
26	$162\frac{1}{2}$	325	650	1300	1950	2600	3250	3900	4550	5200
27	$168\frac{3}{4}$	$337\frac{1}{2}$	675	1350	2025	2700	3375	4050	4725	5400
28	175	350	700	1400	2100	2800	3500	4200	4900	5600
29	$181\frac{1}{4}$	$362\frac{1}{2}$	725	1450	2175	2900	3625	4350	5075	5800
30	$187\frac{1}{2}$	375	750	1500	2250	3000	3750	4500	5250	6000
31	$193\frac{3}{4}$	$387\frac{1}{2}$	775	1550	2325	3100	3875	4650	5425	6200
32	200	400	800	1600	2400	3200	4000	4800	5600	6400
33	$206\frac{1}{4}$	$412\frac{1}{2}$	825	1650	2475	3300	4125	4950	5775	6600
34	$212\frac{1}{2}$	425	850	1700	2550	3400	4250	5100	5950	6800
35	$218\frac{3}{4}$	$437\frac{1}{2}$	875	1750	2625	3500	4375	5250	6125	7000
36	225	450	900	1800	2700	3600	4500	5400	6300	7200
37	$231\frac{1}{4}$	$462\frac{1}{2}$	925	1850	2775	3700	4625	5550	6475	7400
38	$237\frac{1}{2}$	475	950	1900	2850	3800	4750	5700	6650	7600
39	$243\frac{3}{4}$	$487\frac{1}{2}$	975	1950	2925	3900	4875	5850	6825	7800
40	250	500	1000	2000	3000	4000	5000	6000	7000	8000
41	$256\frac{1}{4}$	$512\frac{1}{2}$	1025	2050	3075	4100	5125	6150	7175	8200
42	$262\frac{1}{2}$	525	1050	2100	3150	4200	5250	6300	7350	8400
43	$268\frac{3}{4}$	$537\frac{1}{2}$	1075	2150	3225	4300	5375	6450	7525	8600
44	275	550	1100	2200	3300	4400	5500	6600	7700	8800
45	$281\frac{1}{4}$	$562\frac{1}{2}$	1125	2250	3375	4500	5625	6750	7875	9000
46	$287\frac{1}{2}$	575	1150	2300	3450	4600	5750	6900	8050	9200
47	$293\frac{3}{4}$	$587\frac{1}{2}$	1175	2350	3525	4700	5875	7050	8225	9400
48	300	600	1200	2400	3600	4800	6000	7200	8400	9600
49	$306\frac{1}{4}$	$612\frac{1}{2}$	1225	2450	3675	4900	6125	7350	8575	9800
50	312	625	1250	2500	3750	5000	6250	7500	8750	10000

TABLE II. *continued.*
CUBIC CONTENTS OF OBLONG STACKS.
Breadth, 25 feet.

Length.	Height.									
	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.
1	225	250	275	300	325	350	375	400	425	450
2	450	500	550	600	650	700	750	800	850	900
3	675	750	825	900	975	1050	1125	1200	1275	1350
4	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
5	1125	1250	1375	1500	1625	1750	1875	2000	2125	2250
6	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
7	1575	1750	1925	2100	2275	2450	2625	2800	2975	3150
8	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600
9	2025	2250	2475	2700	2925	3150	3375	3600	3825	4050
10	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500
11	2475	2750	3025	3300	3575	3850	4125	4400	4675	4950
12	2700	3000	3300	3600	3900	4200	4500	4800	5100	5400
13	2925	3250	3575	3900	4225	4550	4875	5200	5525	5850
14	3150	3500	3850	4200	4550	4900	5250	5600	5950	6300
15	3375	3750	4125	4500	4875	5250	5625	6000	6375	6750
16	3600	4000	4400	4800	5200	5600	6000	6400	6800	7200
17	3825	4250	4675	5100	5525	5950	6375	6800	7225	7650
18	4050	4500	4950	5400	5850	6300	6750	7200	7650	8100
19	4275	4750	5225	5700	6175	6650	7125	7600	8075	8550
20	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000
21	4725	5250	5775	6300	6825	7350	7875	8400	8925	9450
22	4950	5500	6050	6600	7150	7700	8250	8800	9350	9900
23	5175	5750	6325	6900	7475	8050	8625	9200	9775	10350
24	5400	6000	6600	7200	7800	8400	9000	9600	10200	10800
25	5625	6250	6875	7500	8125	8750	9375	10000	10625	11250
26	5850	6500	7150	7800	8450	9100	9750	10400	11050	11700
27	6075	6750	7425	8100	8775	9450	10125	10800	11475	12150
28	6300	7000	7700	8400	9100	9800	10500	11200	11900	12600
29	6525	7250	7975	8700	9425	10150	10875	11600	12325	13050
30	6750	7500	8250	9000	9750	10500	11250	12000	12750	13500
31	6975	7750	8525	9300	10075	10850	11625	12400	13175	13950
32	7200	8000	8800	9600	10400	11200	12000	12800	13600	14400
33	7425	8250	9075	9900	10725	11550	12375	13200	14025	14850
34	7650	8500	9350	10200	11050	11900	12750	13600	14450	15300
35	7875	8750	9625	10500	11375	12250	13125	14000	14875	15750
36	8100	9000	9900	10800	11700	12600	13500	14400	15300	16200
37	8325	9250	10175	11100	12025	12950	13875	14800	15725	16650
38	8550	9500	10450	11400	12350	13300	14250	15200	16150	17100
39	8775	9750	10725	11700	12675	13650	14625	15600	16575	17550
40	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000
41	9225	10250	11275	12300	13325	14350	15375	16400	17425	18450
42	9450	10500	11550	12600	13650	14700	15750	16800	17850	18900
43	9675	10750	11825	12900	13975	15050	16125	17200	18275	19350
44	9900	11000	12100	13200	14300	15400	16500	17600	18700	19800
45	10125	11250	12375	13500	14625	15750	16875	18000	19125	20250
46	10350	11500	12650	13800	14950	16100	17250	18400	19550	20700
47	10575	11750	12925	14100	15275	16450	17625	18800	19975	21150
48	10800	12000	13200	14400	15600	16800	18000	19200	20400	21600
49	11025	12250	13475	14700	15925	17150	18375	19600	20825	22050
50	11250	12500	13750	15000	16250	17500	18750	20000	21250	22500

TABLE III.
WEIGHT OF HAY AND STRAW.

SHOWS THE CUBICAL CONTENT AND WEIGHT IN A STACK OF HAY
OR STRAW, FROM 5 TO 12,000 CUBIC FEET, AND WEIGHING 4
TO 10½ LBS. PER CUBIC FOOT.

In the first page of the Table the content and weight of straw are given in loads of 36 trusses, weighing 11 cwt. 2 qrs. 8 lbs., and in the following six pages the content and weight of hay will be found in tons weighing 2,240 lbs.

The content of stacks is given in cubic feet, placed in the first or left-hand column, and along the top of the other columns will be found the supposed weight per cubic foot; under which, and opposite any given number of cubic feet, will be found the weight in tons, trusses, and lbs.

Example 1.—Having ascertained in Table I. the content of a round stack to be 6305 cubic feet, and estimated it to weigh 7 lbs. per cubic foot, on turning to Table III., p. 46, will be found in the first or left hand column—

Feet.	lbs.	Tons.	trusses.	lbs.
6250	opposite, and under 7 stands	19	21	14
50	" "		6	14
5	" "			35
<hr/> 6305	Content	<hr/> 19	<hr/> 28	<hr/> 7

Example 2.—Having found in Table II. the content of a stack of an oblong form to be 4750 cubic feet, and estimated it to weigh 7½ lbs. per cubic foot, on turning to Table III., p. 46, will be found in the first or left-hand column 4750 feet; opposite, and under 7½ lbs. per cubic foot, stands the content, 15 tons 14 trusses 58½ lbs.

Example 3.—Having ascertained in Table II. the content of a stack to be 6380 cubic feet, and estimated it to weigh $8\frac{1}{2}$ lbs. per cubic foot, on turning to Table III., p. 47, will be found in the first or left-hand column—

Feet.		lbs.	Tons.	trusses.	lbs.
6250	opposite and under $8\frac{1}{2}$ stands		23	28	37
100	"	"		15	10
25	"	"		3	$4\frac{1}{2}$
5	"	"			$42\frac{1}{2}$
<u>6380</u>		Content	<u>24</u>	<u>8</u>	<u>22</u>

In London, and for a distance of 25 miles round, hay is generally bought and sold by the load of 18 cwt. or 36 trusses, weighing 56 lbs. each truss.

New hay, if sold before the 31st of August, must weigh 19 cwt. 1 qr. 4 lbs., or 36 trusses, weighing 60 lbs. each truss.

In the country districts hay is generally bought and sold by the ton of 20 cwt., or 40 trusses, weighing 56 lbs. each truss.

In some parts of the North and West of England, hay is bought and sold by the imperial stone of 14 lbs. weight.

In Scotland, the stone weight varies much, the Dutch, or Trone stone, varies from $17\frac{1}{2}$ to 24 lbs.

The following table shows the comparative number of cubic feet, or cubic yards, in a ton weight of hay or straw, according to the number of pounds weight in a cubic foot, as follows :—

	Per cubic foot.		Cubic feet per ton.		Cubic yards per ton.
Clover Hay	.. $8\frac{1}{2}$ lbs.	..	271·515	..	10·056
Grass do.	.. 8 "	..	280·	..	10·370
Tare do.	.. 7 "	..	320·	..	11·814
Oaten do.	.. $6\frac{1}{2}$ "	..	344·615	..	12·763
Wheat Straw	.. $4\frac{1}{2}$ "	..	497·444	..	18·436
Oat do.	.. 4 "	..	560·	..	20·740
Barley do.	.. $3\frac{1}{2}$ "	..	640·	..	23·703

The above will be found a fair average weight per cubic foot for hay or straw, provided it has been in stack three

months or more ; but should a stack have been set up less than two months it will not weigh so much by a pound per cubic foot.

NOTE.—As the average weight in pounds per cubic foot of hay or straw, so is the equivalent number of cubic feet, or cubic yards, to the ton weight of 2240 lbs.

See Table V., p. 51.

WEIGHT OF HAY AND STRAW.

	Cwt.	qrs.	lbs.
A Ton of Old Hay or Straw	20	0	0
A Load of New Hay „	19	1	4
A Load of Old Hay „	18	0	0
A Load of Straw	11	2	8
60 lbs. of New Hay	1	truss.	
56 lbs. of Old Hay	1	truss.	
40 Trusses of Hay	1	ton.	
36 Trusses of Hay	1	load.	
36 lbs. of Straw	1	truss.	
36 Trusses of Straw	1	load.	

WEIGHT OF BARK.

Should it ever be found requisite either to value or sell by public auction any quantity of bark in stacks, those who are interested may do well to apply to the author of these Tables, Mr. JOHN STEELE, Chelmsford, Essex, who has gained some considerable experience as to the weight of bark

TABLE III.
WEIGHT OF STRAW.

	4 lbs.			4½ lbs.			4¾ lbs.			5 lbs.		
Cubieft.	lds.	truss.	lbs.	lds.	truss.	lbs.	lds.	truss.	lbs.	lds.	truss.	lbs.
5	0	0	20	0	0	21½	0	0	22½	0	0	23½
9	0	1	0	0	1	2½	0	1	4½	0	1	6½
14	0	1	20	0	1	23½	0	1	27	0	1	30½
25	0	2	28	0	2	34½	0	3	4½	0	3	10½
50	0	5	20	0	5	32½	0	6	9	0	6	21½
75	0	8	12	0	8	30½	0	9	13½	0	9	32½
100	0	11	4	0	11	29	0	12	18	0	13	7
150	0	16	24	0	17	25½	0	18	27	0	19	28½
250	0	27	28	0	29	18½	0	31	9	0	32	35½
500	1	19	20	1	23	1	1	26	18	1	29	35
750	2	11	12	2	16	19½	2	21	27	2	26	34½
1000	3	3	4	3	10	2	3	17	0	3	23	34
1250	3	30	32	4	3	20½	4	12	9	4	20	33½
1500	4	22	24	4	33	3	5	7	18	5	17	33
1750	5	14	16	5	26	21½	6	2	27	6	14	32½
2000	6	6	8	6	20	4	6	34	0	7	11	32
2250	6	34	0	7	13	22½	7	29	9	8	8	31½
2500	7	25	28	8	7	5	8	24	18	9	5	31
2750	8	17	20	9	0	23½	9	19	27	10	2	30½
3000	9	9	12	9	30	6	10	15	0	10	35	30
3250	10	1	4	10	23	24½	11	10	9	11	32	29½
3500	10	28	32	11	17	7	12	5	18	12	29	29
3750	11	20	24	12	10	25½	13	0	27	13	26	28½
4000	12	12	16	13	4	8	13	32	0	14	23	28
4250	13	4	8	13	33	26½	14	27	9	15	20	27½
4500	13	32	0	14	27	9	15	22	18	16	17	27
4750	14	23	28	15	20	27½	16	17	27	17	14	26½
5000	15	15	20	16	14	10	17	13	0	18	11	26
5250	16	7	12	17	7	28½	18	8	9	19	8	25½
5500	16	35	4	18	1	11	19	3	18	20	5	25
5750	17	26	32	18	30	29½	19	37	27	20	22	24½
6000	18	18	24	19	24	12	20	30	0	21	35	24
6250	19	10	16	20	17	30½	21	25	9	22	32	23½
6500	20	2	8	21	11	13	22	20	18	23	29	23
6750	20	30	0	22	4	31½	23	15	27	24	26	22½
7000	21	21	28	22	34	14	24	11	0	25	23	22
7250	22	13	20	23	27	32½	25	6	9	26	20	21½
7500	23	5	12	24	21	15	26	1	18	27	17	21
7750	23	33	4	25	14	33½	26	32	27	28	14	20½
8000	24	24	32	26	8	16	27	28	0	29	11	20
8250	25	26	24	27	1	34½	28	23	9	30	8	19½
8500	26	8	16	27	31	17	29	18	18	31	5	19
8750	27	0	8	28	24	35½	30	13	27	32	2	18½
9000	27	28	0	29	18	18	31	9	0	32	35	18
9250	28	19	28	30	12	0½	32	4	9	33	32	17½
9500	29	11	20	31	5	19	32	35	18	34	29	17
10000	30	31	4	32	28	20	34	26	0	36	23	16
10500	32	14	24	34	15	21	36	16	18	38	17	15
11000	33	34	8	36	2	22	38	7	0	40	11	14
11500	35	17	28	37	25	23	39	33	18	42	5	13
12000	37	1	12	39	12	24	41	24	0	43	35	12

TABLE III. *continued.*

WEIGHT OF HAY.

Cubic ft.	5 lbs.		5½ lbs.		6½ lbs.		6½ lbs.	
	tons.	truss. lbs.	tons.	truss. lbs.	tons.	truss. lbs.	tons.	truss. lbs.
5	0	0 25	0	0 26½	0	0 27½	0	0 28½
9	0	0 45	0	0 47½	0	0 49½	0	0 51½
14	0	1 14	0	1 17½	0	1 21	0	1 24
25	0	2 13	0	2 16	0	2 19½	0	2 22½
50	0	4 26	0	4 32	0	4 38½	0	4 45
75	0	6 39	0	6 48	0	7 2	0	7 11
100	0	8 52	0	9 8½	0	9 21	0	9 33½
150	0	13 22	0	13 40	0	14 3½	0	14 22
250	0	22 18	0	22 49	0	23 24½	0	24 0
500	1	4 36	1	5 42½	1	6 49	1	7 55½
750	1	26 54	1	28 36	1	30 17½	1	31 55
1000	2	9 16	2	11 29	2	13 42	2	15 55
1250	2	31 34	2	34 22	2	37 10½	2	39 55
1500	3	13 52	3	17 15½	3	20 35	3	22 54½
1750	3	36 14	4	0 9	4	4 3½	4	7 54
2000	4	18 32	4	23 2	4	27 28	4	31 54
2250	5	0 50	5	5 51	5	10 52½	5	15 54
2500	5	23 12	5	28 44½	5	34 21	5	39 53½
2750	6	5 30	6	11 38	6	17 45½	6	23 53
3000	6	27 48	6	34 31	7	1 14	7	7 53
3250	7	10 10	7	17 24	7	24 38½	7	31 53
3500	7	32 28	8	0 17½	8	8 7	8	15 52½
3750	8	14 46	8	23 10	8	31 31½	8	39 52
4000	8	37 8	9	6 4	9	15 0	9	23 52
4250	9	19 26	9	28 53	9	38 24½	10	7 52
4500	10	1 44	10	11 46½	10	21 49	10	31 51½
4750	10	24 6	10	34 40	11	5 17½	11	15 51
5000	11	6 24	11	17 33	11	28 42	11	39 51
5250	11	28 42	12	0 26	12	12 10½	12	23 51
5500	12	11 4	12	23 19½	12	35 35	13	7 50½
5750	12	33 22	13	6 13	13	19 4½	13	31 50
6000	13	15 40	13	29 6	14	2 28	14	15 50
6250	13	38 2	14	11 55	14	26 52½	14	39 50
6500	14	20 20	14	34 48½	15	9 21	15	23 49½
6750	15	2 38	15	17 42	15	32 45½	16	7 49
7000	15	25 0	16	0 35	16	16 14	16	31 49
7250	16	7 18	16	23 28	16	39 38½	17	15 49
7500	16	29 36	17	6 21½	17	23 7	17	39 48½
7750	17	11 54	17	29 15	18	6 31½	18	23 48
8000	17	34 16	18	12 8	18	30 0	19	7 48
8250	18	16 34	18	35 1	19	13 24½	19	31 48
8500	18	38 52	19	17 50½	19	36 49	20	15 47½
8750	19	21 14	20	0 43	20	20 17½	20	39 47
9000	20	3 32	20	23 37	21	3 42	21	23 47
9250	20	25 50	21	6 30	21	27 10½	22	27 47
9500	21	8 12	21	29 23½	22	10 35	22	31 46½
10000	22	12 48	22	35 10	23	17 28	23	39 46
10500	23	17 28	24	0 52½	24	24 21	25	7 46½
11000	24	22 8	25	6 39	25	31 14	26	15 46
11500	25	26 44	26	12 25½	26	38 7	27	23 44½
12000	26	31 24	27	18 12	28	5 0	28	31 44

TABLE III. *continued.*

WEIGHT OF HAY.

	6 lbs.			6½ lbs.			6¾ lbs.			6⅞ lbs.		
Cubic ft.	tons.	truss.	lbs.	tons.	truss.	lbs.	tons.	truss.	lbs.	tons.	truss.	lbs.
5	0	0	30	0	0	31½	0	0	32½	0	0	32½
9	0	0	54	0	1	0½	0	1	2½	0	1	4½
14	0	1	28	0	1	31½	0	1	35	0	1	38½
25	0	2	38	0	2	44½	0	2	50½	0	3	0½
50	0	5	20	0	5	32½	0	5	45	0	6	1½
75	0	8	2	0	8	20½	0	8	39½	0	9	2½
100	0	10	40	0	11	9	0	11	34	0	12	3
150	0	16	4	0	16	41½	0	17	23	0	18	4½
250	0	26	44	0	27	50½	0	29	1	0	30	7½
500	1	13	32	1	15	45	1	18	2	1	20	15
750	2	0	20	2	3	39½	2	7	3	2	10	22½
1000	2	27	8	2	31	34	2	36	4	3	0	30
1250	3	13	52	3	19	28½	3	25	5	3	30	37½
1500	4	0	40	4	7	23	4	14	6	4	20	45
1750	4	27	28	4	35	17½	5	3	7	5	10	52½
2000	5	14	16	5	23	12	5	32	8	6	1	4
2250	6	1	4	6	11	6½	6	21	9	6	31	11½
2500	6	27	48	6	39	1	7	10	10	7	21	19
2750	7	14	36	7	26	51½	7	39	11	8	11	26½
3000	8	1	24	8	14	46	8	28	12	9	1	34
3250	8	28	12	9	2	40½	9	17	13	9	31	41½
3500	9	15	0	9	30	35	10	6	14	10	21	49
3750	10	1	44	10	18	29½	10	35	15	11	12	0½
4000	10	28	32	11	6	24	11	24	16	12	2	8
4250	11	15	20	11	34	18½	12	13	17	12	32	15½
4500	12	2	8	12	22	13	13	2	18	13	22	23
4750	12	28	52	13	10	7½	13	31	19	14	12	30½
5000	13	15	40	13	38	2	14	20	20	15	2	38
5250	14	2	28	14	25	52½	15	9	21	15	32	45½
5500	14	29	16	15	13	47	15	38	22	16	22	53
5750	15	16	4	16	1	41½	16	27	23	17	13	4½
6000	16	2	48	16	29	36	17	16	24	18	3	12
6250	16	29	36	17	17	30½	18	5	25	18	33	19½
6500	17	16	24	18	5	25	18	34	26	19	23	27
6750	18	3	12	18	33	19½	19	23	27	20	13	34½
7000	18	30	0	19	21	14	20	14	28	21	3	42
7250	19	16	44	20	9	8½	21	1	29	21	33	49½
7500	20	3	32	20	37	3	21	30	30	22	24	1
7750	20	30	20	21	4	53½	22	19	31	23	14	8½
8000	21	17	8	22	12	48	23	8	32	24	4	16
8250	22	3	52	23	0	42½	23	37	33	24	34	23½
8500	22	30	40	23	28	37	24	16	34	25	24	31
8750	23	17	48	24	16	31½	25	15	35	26	14	38½
9000	24	4	16	25	4	26	26	4	36	27	4	46
9250	24	31	4	25	32	20½	26	33	37	27	34	52½
9500	25	17	48	26	20	15	27	23	38	28	25	5
10000	26	31	24	27	36	4	29	0	40	30	5	20
10500	28	5	0	29	11	41	30	18	42	31	25	35
11000	29	18	32	30	27	38	31	36	44	33	5	50
11500	30	28	8	32	3	27	33	14	46	34	26	9
12000	32	5	40	33	19	16	34	32	48	36	6	24

TABLE III. *continued.*

WEIGHT OF HAY.

	7 lbs.	7½ lbs.	7½ lbs.	7½ lbs.
Cubic ft.	tons. truss. lbs.	tons. truss. lbs.	tons. truss. lbs.	tons. truss. lbs.
5	0 0 35	0 0 36½	0 0 37½	0 0 38½
9	0 1 7	0 1 9½	0 1 11½	0 1 13½
14	0 1 42	0 1 45½	0 1 49	0 1 52½
25	0 3 7	0 3 13½	0 3 19½	0 3 25½
50	0 6 14	0 6 26½	0 6 39	0 6 51½
75	0 9 21	0 9 39½	0 10 2½	0 10 21½
100	0 12 28	0 12 53	0 13 22	0 13 47
150	0 18 42	0 19 23½	0 20 5	0 20 42½
250	0 31 14	0 32 20½	0 33 27	0 34 33½
500	1 22 28	1 24 41	1 26 54	1 29 11
750	2 13 42	2 17 5½	2 20 25	2 23 44½
1000	3 5 0	3 9 26	3 13 52	3 18 22
1250	3 36 14	4 1 46½	4 7 23	4 22 55½
1500	4 27 28	4 34 11	5 0 50	5 7 33
1750	5 18 42	5 26 31½	5 24 21	6 2 10½
2000	6 10 0	6 18 52	6 27 48	6 36 44
2250	7 1 14	7 11 16½	7 21 19	7 31 21½
2500	7 32 28	8 3 37	8 14 46	8 25 55
2750	8 23 42	8 36 1½	9 8 17	9 20 22½
3000	9 15 0	9 28 22	10 1 44	10 15 10
3250	10 16 14	10 20 42½	10 35 15	11 9 43½
3500	10 37 28	11 13 7	11 28 42	12 4 21
3750	11 28 42	12 5 27½	12 22 13	12 38 54½
4000	12 20 0	12 37 48	13 15 40	13 33 32
4250	13 11 14	13 30 12½	14 9 11	14 28 9½
4500	14 2 28	14 22 33	15 2 38	15 22 43
4750	14 33 42	15 14 53½	15 36 9	16 16 20½
5000	15 25 0	16 7 18	16 29 36	17 11 54
5250	16 16 14	16 39 38½	17 23 7	18 6 31½
5500	17 7 28	17 32 3	18 16 34	19 1 9
5750	17 38 48	18 24 23½	19 10 5	19 35 42½
6000	18 30 0	19 16 44	20 3 32	20 30 20
6250	19 21 14	20 9 8½	20 37 3	21 24 53½
6500	20 12 28	21 1 29	21 33 30	22 19 31
6750	21 3 42	21 33 49½	22 24 1	23 14 8½
7000	21 25 0	22 26 14	23 17 28	24 8 42
7250	22 26 14	23 18 34½	24 0 55	25 3 19½
7500	23 17 28	24 10 55	25 4 26	25 37 53
7750	24 8 42	25 3 19½	25 37 53	26 32 30½
8000	25 0 0	25 35 40	26 31 24	27 28 8
8250	25 31 14	26 28 4½	27 24 51	28 21 41½
8500	26 32 28	27 20 25	28 18 22	29 26 19
8750	27 13 42	28 12 45½	29 11 49	30 10 52½
9000	28 5 0	29 5 10	30 5 20	31 5 30
9250	28 36 14	29 37 30½	30 38 47	32 0 7½
9500	29 27 28	30 29 51	31 32 18	32 34 41
10000	31 10 0	32 14 36	33 19 16	34 23 52
10500	32 32 28	33 39 21	35 6 14	36 13 7
11000	34 15 0	35 24 6	36 33 12	38 2 18
11500	35 37 28	37 8 47	38 20 10	39 31 29
12000	37 20 0	38 33 32	40 7 8	41 20 40

TABLE III. *continued.*

WEIGHT OF HAY.

	8 lbs.			8½ lbs.			8¾ lbs.			8⅞ lbs.		
Cubic ft.	tons.	truss.	lbs.	tons.	truss.	lbs.	tons.	truss.	lbs.	tons.	truss.	lbs.
5	0	0	40	0	0	41½	0	0	42½	0	0	43½
9	0	1	16	0	1	18½	0	1	20½	0	1	22½
14	0	2	0	0	2	3½	0	2	7	0	2	10½
25	0	3	32	0	3	38½	0	3	44½	0	3	50½
50	0	7	8	0	7	20½	0	7	33	0	7	45½
75	0	10	40	0	11	2½	0	11	21½	0	11	40½
100	0	14	16	0	14	41	0	15	10	0	15	35
150	0	21	24	0	22	5½	0	22	43	0	23	24½
250	0	35	40	0	36	46½	0	37	53	0	39	3½
500	1	31	24	1	33	37	1	35	50	1	38	7
750	2	27	38	2	30	27½	2	33	47	2	37	10½
1000	3	22	48	3	27	18	3	31	44	3	36	14
1250	4	18	32	4	24	8½	4	29	41	4	35	17½
1500	5	14	16	5	20	55	5	27	38	5	34	21
1750	6	10	0	6	17	45½	6	25	35	6	33	24½
2000	7	5	40	7	14	36	7	23	32	7	32	28
2250	8	1	24	8	11	26½	8	21	29	8	31	31½
2500	8	37	8	9	8	17	9	19	26	9	30	35
2750	9	32	48	10	5	7½	10	17	23	10	29	38½
3000	10	28	32	11	1	54	11	15	20	11	28	42
3250	11	24	16	11	38	44½	12	13	17	12	27	45½
3500	12	20	0	12	35	35	13	11	14	13	26	49
3750	13	15	40	13	32	25½	14	9	11	14	25	52½
4000	14	11	24	14	29	16	15	7	8	15	25	0
4250	15	7	8	15	26	6½	16	5	5	16	24	3½
4500	16	2	48	16	22	53	17	3	2	17	23	7
4750	16	38	32	17	19	43½	18	0	55	18	22	10½
5000	17	34	16	18	16	34	18	38	52	19	21	14
5250	18	30	0	19	13	24½	19	36	49	20	20	17½
5500	19	25	40	20	10	15	20	34	26	21	19	21
5750	20	21	24	21	7	5½	21	32	43	22	18	24½
6000	21	17	8	22	3	52	22	30	40	23	17	28
6250	22	12	48	23	0	42½	23	28	37	24	16	31½
6500	23	8	32	23	37	33	24	26	34	25	15	35
6750	24	4	16	24	34	23½	25	24	31	26	14	38½
7000	25	0	0	25	31	14	26	22	28	27	13	42
7250	25	35	40	26	28	4½	27	20	25	28	12	45½
7500	26	31	24	27	24	51	28	18	22	29	11	49
7750	27	27	8	28	21	41½	29	16	19	30	10	52½
8000	28	22	48	29	18	32	30	14	16	31	10	0
8250	29	18	32	30	15	22½	31	12	13	32	9	3½
8500	30	14	16	31	12	13	32	10	10	33	8	7
8750	31	10	0	32	9	3½	33	8	7	34	7	10½
9000	32	5	40	33	5	50	34	6	4	35	6	14
9250	33	1	24	34	2	40½	35	4	1	36	5	17½
9500	33	37	8	34	39	31	36	1	54	37	4	21
10000	35	28	32	36	33	12	37	37	48	39	2	28
10500	37	20	0	38	26	49	39	33	42	41	0	35
11000	39	11	24	40	20	30	41	29	36	42	38	42
11500	41	2	48	42	14	11	43	25	30	44	36	49
12000	42	34	16	44	7	48	45	21	24	46	35	0

TABLE III. *continued.*

WEIGHT OF HAY.

	9 lbs.			9½ lbs.			9¾ lbs.			9⅞ lbs.		
Cubic ft.	tons.	truss.	lbs.	tons.	truss.	lbs.	tons.	truss.	lbs.	tons.	truss.	lbs.
5	0	0	45	0	0	47½	0	0	49½	0	0	51½
9	0	1	25	0	1	26½	0	1	29½	0	1	31½
14	0	2	14	0	2	17½	0	2	21	0	2	24½
25	0	4	1	0	4	7½	0	4	13½	0	4	19½
50	0	8	2	0	8	14½	0	8	27	0	8	39½
75	0	12	3	0	12	21½	0	12	40½	0	13	3½
100	0	16	4	0	16	29	0	16	54	0	17	23
150	0	24	26	0	24	43½	0	25	25	0	26	6½
250	1	0	10	1	1	16½	1	2	23	1	3	29½
500	2	0	20	2	2	33	2	4	46	2	7	3
750	3	0	30	3	3	49½	3	7	13	3	10	32½
1000	4	0	40	4	5	10	4	9	36	4	14	6
1250	5	0	50	5	6	26½	5	12	3	5	17	35½
1500	6	1	4	6	7	43	6	14	26	6	21	9
1750	7	1	14	7	9	3½	7	16	49	7	24	38½
2000	8	1	24	8	10	20	8	19	16	8	28	12
2250	9	1	34	9	11	36½	9	21	29	9	31	41½
2500	10	1	44	10	12	53	10	24	6	10	35	15
2750	11	1	54	11	14	13½	11	26	29	11	38	44½
3000	12	2	8	12	15	30	12	28	52	13	2	18
3250	13	2	18	13	6	46½	13	31	19	14	5	47½
3500	14	2	28	14	18	7	14	33	42	15	9	21
3750	15	2	38	15	19	23½	15	36	9	16	12	50½
4000	16	2	48	16	20	40	16	38	32	17	16	24
4250	17	3	2	17	22	9½	18	0	55	18	19	53½
4500	18	3	12	18	23	17	19	3	22	19	23	27
4750	19	3	22	19	24	33½	20	5	45	20	27	0½
5000	20	3	32	20	25	50	21	8	12	21	30	30
5250	21	3	42	21	27	10½	22	10	35	22	34	3½
5500	22	3	52	22	28	27	23	3	2	23	37	33
5750	23	4	6	23	29	43½	24	15	25	25	1	6½
6000	24	4	16	24	31	4	25	17	48	26	4	36
6250	25	4	26	25	32	20½	26	20	15	27	8	9½
6500	26	4	36	26	33	37	27	22	28	28	11	39
6750	27	4	46	27	34	53½	28	25	5	29	15	12½
7000	28	5	0	28	36	14	29	27	28	30	18	42
7250	29	5	10	29	37	30½	30	29	51	31	22	15½
7500	30	5	20	30	38	47	31	32	18	32	25	45
7750	31	5	30	32	0	7½	32	34	41	33	29	18½
8000	32	5	40	33	1	24	33	37	8	34	32	48
8250	33	5	50	34	2	40½	34	39	31	35	36	21½
8500	34	6	4	35	4	1	36	1	54	36	39	51
8750	35	6	14	36	5	17½	37	4	21	38	2	24½
9000	36	6	24	37	6	34	38	6	44	39	6	54
9250	37	6	34	38	7	50½	39	9	11	40	10	27½
9500	38	6	44	39	9	11	40	11	34	41	14	1
10000	40	7	8	41	11	44	42	16	24	43	21	4
10500	42	7	28	43	14	21	44	21	14	45	28	7
11000	44	7	48	45	16	54	46	26	4	47	35	10
11500	46	8	12	47	19	31	48	30	50	50	2	13
12000	48	8	32	49	22	8	50	35	40	59	9	16

TABLE III. *continued.*

WEIGHT OF HAY.

	10lbs.		10½ lbs.		10½ lbs.		10½ lbs.	
Cubic ft.	tons.	truss. lbs.	tons.	truss. lbs.	tons.	truss. lbs.	tons.	truss. lbs.
5	0	0 50	0	0 51½	0	0 52½	0	0 53½
9	0	1 34	0	1 36½	0	1 38½	0	1 40½
14	0	2 28	0	2 31½	0	2 35	0	2 39½
25	0	4 26	0	4 32½	0	4 38½	0	4 44½
50	0	8 52	0	9 8½	0	9 21	0	9 33½
75	0	13 22	0	13 40½	0	14 3½	0	14 22½
100	0	17 48	0	18 17	0	18 42	0	19 11
150	0	26 44	0	27 25½	0	28 7	0	28 44½
250	1	4 36	1	5 42½	1	6 49	1	7 55½
500	2	9 16	2	11 29	2	13 42	2	15 55
750	3	13 52	3	17 15½	3	20 35	3	22 54½
1000	4	18 32	4	23 2	4	27 28	4	31 54
1250	5	23 12	5	28 44½	5	34 21	5	39 53½
1500	6	27 48	6	34 31	7	1 14	7	7 53
1750	7	32 28	8	0 17½	8	8 7	8	15 52½
2000	8	37 8	9	6 4	9	15 0	9	23 52
2250	10	1 44	10	11 46½	10	21 49	10	31 51½
2500	11	6 24	11	17 33	11	28 42	11	39 51
2750	12	11 4	12	23 19½	12	35 35	13	7 50½
3000	13	15 40	13	29 6	14	2 28	14	15 50
3250	14	20 20	14	34 48½	15	9 21	15	23 49½
3500	15	25 0	16	0 35	16	16 14	16	31 49
3750	16	29 36	17	6 21½	17	23 7	17	39 48½
4000	17	34 16	18	12 8	18	30 0	19	7 48
4250	18	38 52	19	17 50½	19	36 49	20	15 47½
4500	20	3 32	20	23 37	21	3 42	21	23 47
4750	21	8 12	21	29 23½	22	10 35	22	31 46½
5000	22	12 48	22	35 10	23	17 28	23	39 46
5250	23	17 28	24	0 52½	24	24 21	25	7 45½
5500	24	22 8	25	6 39	25	31 14	26	15 45
5750	25	26 44	26	12 25½	26	38 7	27	23 44½
6000	26	31 24	27	18 12	28	5 0	28	31 44
6250	27	36 4	28	23 54½	29	11 49	29	39 43½
6500	29	0 40	29	29 41	30	18 42	31	7 43
6750	30	5 20	30	35 27½	31	25 35	32	15 42½
7000	31	10 0	32	1 14	32	32 28	33	23 42
7250	32	14 36	33	7 0½	33	39 21	34	31 41½
7500	33	19 16	34	12 43	35	6 14	35	39 41
7750	34	23 52	35	18 29½	36	13 7	37	7 40½
8000	35	28 32	36	24 16	37	20 0	38	15 40
8250	36	33 12	37	30 2½	38	26 49	39	23 39½
8500	37	37 48	38	35 45	39	33 42	40	31 39
8750	39	2 28	40	1 31½	41	0 35	41	39 38½
9000	40	7 8	41	7 18	42	7 28	43	7 38
9250	41	11 44	42	13 4½	43	14 21	44	15 37½
9500	42	16 24	43	18 47	44	21 14	45	23 37
10000	44	25 40	45	30 20	46	35 0	47	39 36
10500	46	35 0	48	1 49	49	8 42	50	15 35
11000	49	4 16	50	13 22	51	22 28	52	31 24
11500	51	13 32	52	24 51	53	36 14	55	7 33
12000	53	22 48	54	36 24	56	10 0	57	23 32

TABLE IV.

MEASURING AND WEIGHT OF HAY.

Shows the depth in inches of a truss of Hay 24 inches wide and 30, 33 and 36 inches long, measuring end of stack and squaring. The solidity and weight per cubic foot as follows:—

lbs. per cubic ft	36 inches long. 24 " wide.	33 inches long. 24 " wide.	30 inches long. 24 " wide.
	depth.	depth.	depth.
1	112·000	102·666	93·333
1 $\frac{1}{4}$	98·600	82·133	74·666
1 $\frac{1}{2}$	84·000	77·000	70·000
1 $\frac{3}{4}$	67·200	61·600	56·000
2	56·000	51·333	46·666
2 $\frac{1}{4}$	50·100	45·925	41·750
2 $\frac{1}{2}$	44·800	41·067	37·000
2 $\frac{3}{4}$	40·726	37·333	33·938
3	37·333	34·222	31·111
3 $\frac{1}{4}$	34·460	31·580	28·716
3 $\frac{1}{2}$	32·000	29·333	26·666
3 $\frac{3}{4}$	30·000	27·500	25·000
4	28·000	25·666	23·333
4 $\frac{1}{4}$	26·355	24·159	21·962
4 $\frac{1}{2}$	24·888	22·814	20·740
4 $\frac{3}{4}$	23·578	21·614	19·648
5	22·400	20·533	18·666
5 $\frac{1}{4}$	21·333	19·739	17·777
5 $\frac{1}{2}$	20·363	18·666	16·969
5 $\frac{3}{4}$	19·478	17·855	16·231
6	18·666	17·111	15·555
6 $\frac{1}{4}$	17·920	16·426	14·933
6 $\frac{1}{2}$	17·230	15·824	14·358
6 $\frac{3}{4}$	16·592	15·209	13·826
7	16·000	14·666	13·333
7 $\frac{1}{4}$	15·448	14·161	12·873
7 $\frac{1}{2}$	14·933	13·688	12·444
7 $\frac{3}{4}$	14·451	13·247	12·042
8	14·000	12·833	11·666
8 $\frac{1}{4}$	13·575	12·444	11·312
8 $\frac{1}{2}$	13·176	12·079	10·980
8 $\frac{3}{4}$	12·800	11·733	10·666
9	12·443	11·487	10·370
9 $\frac{1}{4}$	12·108	11·099	10·090
9 $\frac{1}{2}$	11·789	10·817	9·824
9 $\frac{3}{4}$	11·487	10·530	9·572
10	11·200	10·266	9·333
10 $\frac{1}{4}$	11·926	10·015	9·105
10 $\frac{1}{2}$	10·666	9·777	9·888
10 $\frac{3}{4}$	10·418	9·570	9·681
11	10·186	9·338	8·485
11 $\frac{1}{4}$	9·955	9·058	8·296
11 $\frac{1}{2}$	9·739	8·929	8·116
11 $\frac{3}{4}$	9·531	8·646	7·942
12	9·333	8·555	7·777

TABLE V.

COMPARATIVE WEIGHT OF HAY.

Shows the comparative weight of Hay in lbs. per cubic foot, or in lbs. per cubic yard; also imperial stones per cubic yard; also the number of cubic feet to the cwt.; also the number of cubic feet or cubic yards to the ton.

To Ft.	To Cwt.	To Ton.	To Yd.	To Ton.	To Yard.
lbs.	Cubic feet.	Cubic feet.	lbs.	Cubic yards.	Stones. lbs.
1	112	2240	27	82.9629	1 13
1 $\frac{1}{4}$	89.6	1780	33 $\frac{3}{4}$	66.37	2 5 $\frac{3}{4}$
1 $\frac{1}{2}$	74.666	1493.333	40 $\frac{1}{2}$	55.308	2 12 $\frac{1}{2}$
1 $\frac{3}{4}$	64	1280	47 $\frac{1}{2}$	47.460	3 5 $\frac{1}{2}$
2	56	1120	54	41.481	3 12
2 $\frac{1}{4}$	49.777	995.555	60 $\frac{3}{4}$	36.876	4 4 $\frac{3}{4}$
2 $\frac{1}{2}$	44.8	896	67 $\frac{1}{2}$	33.185	4 11 $\frac{1}{2}$
2 $\frac{3}{4}$	40.727	814.363	74 $\frac{1}{4}$	30.168	5 4 $\frac{1}{4}$
3	37.333	746.666	81	27.777	5 11
3 $\frac{1}{4}$	34.461	689.23	87 $\frac{3}{4}$	25.527	6 3 $\frac{3}{4}$
3 $\frac{1}{2}$	32	640	94 $\frac{1}{2}$	23.703	6 10 $\frac{1}{2}$
3 $\frac{3}{4}$	29.2	597.333	101 $\frac{1}{4}$	22.123	7 3 $\frac{1}{4}$
4	28	560	108	20.740	7 10
4 $\frac{1}{4}$	26.352	527.105	114 $\frac{3}{4}$	19.303	8 2 $\frac{3}{4}$
4 $\frac{1}{2}$	24.888	497.444	121 $\frac{1}{2}$	18.436	8 9 $\frac{1}{2}$
4 $\frac{3}{4}$	23.577	471.578	128 $\frac{1}{4}$	17.465	9 2 $\frac{1}{4}$
5	22.4	448	135	16.592	9 9
5 $\frac{1}{4}$	21.333	426.666	141 $\frac{3}{4}$	15.862	10 1 $\frac{3}{4}$
5 $\frac{1}{2}$	20.363	407.272	148 $\frac{1}{2}$	15.084	10 8 $\frac{1}{2}$
5 $\frac{3}{4}$	19.739	389.565	155 $\frac{1}{4}$	14.428	11 1 $\frac{1}{4}$
6	18.666	373.333	162	13.827	11 8
6 $\frac{1}{4}$	17.29	358.4	168 $\frac{3}{4}$	13.278	12 0 $\frac{3}{4}$
6 $\frac{1}{2}$	17.23	344.615	175 $\frac{1}{2}$	12.763	12 7 $\frac{1}{2}$
6 $\frac{3}{4}$	16.592	331.851	182 $\frac{1}{4}$	12.290	13 0 $\frac{1}{4}$
7	16	320	189	11.814	13 7
7 $\frac{1}{4}$	15.448	308.965	195 $\frac{3}{4}$	11.443	13 13 $\frac{3}{4}$
7 $\frac{1}{2}$	14.933	298.666	202 $\frac{1}{2}$	11.061	14 6 $\frac{1}{2}$
7 $\frac{3}{4}$	14.45	289.032	209 $\frac{1}{4}$	10.704	14 13 $\frac{1}{4}$
8	14	280	216	10.370	15 6
8 $\frac{1}{4}$	13.575	271.515	222 $\frac{3}{4}$	10.056	15 12 $\frac{3}{4}$
8 $\frac{1}{2}$	13.176	263.529	229 $\frac{1}{2}$	9.760	16 5 $\frac{1}{2}$
8 $\frac{3}{4}$	12.8	256	236 $\frac{1}{4}$	9.481	16 12 $\frac{1}{4}$
9	12.444	248.888	243	9.218	17 5
9 $\frac{1}{4}$	12.108	242.162	249 $\frac{3}{4}$	8.968	17 11 $\frac{3}{4}$
9 $\frac{1}{2}$	11.789	235.789	256 $\frac{1}{2}$	8.740	18 4 $\frac{1}{2}$
9 $\frac{3}{4}$	11.487	229.743	263 $\frac{1}{4}$	8.509	18 11 $\frac{1}{4}$
10	11.2	224	270	8.296	19 4
10 $\frac{1}{4}$	10.92	218.79	276 $\frac{3}{4}$	8.093	19 10 $\frac{3}{4}$
10 $\frac{1}{2}$	10.666	213.333	283 $\frac{1}{2}$	7.906	20 3 $\frac{1}{2}$
10 $\frac{3}{4}$	10.418	208.372	290 $\frac{1}{4}$	7.717	20 10 $\frac{1}{4}$
11	10.181	203.636	297	7.542	21 3
11 $\frac{1}{4}$	9.955	199.111	303 $\frac{3}{4}$	7.374	21 9 $\frac{3}{4}$
11 $\frac{1}{2}$	9.739	194.782	310 $\frac{1}{2}$	7.214	22 2 $\frac{1}{2}$
11 $\frac{3}{4}$	9.532	190.638	317 $\frac{1}{4}$	7.060	22 9 $\frac{1}{4}$
12	9.333	186.666	324	7.913	23 2

TABLE VI.

Shows the relative or equivalent Weight of Hay by the ton weight; 20 cwt., or by the load of 18 cwt., or by the stone of 14 lbs. All loads are converted into tons; also in stones.

tons.	loads.	cwt.	stones.	loads.	tons.	cwt.	stones
$\frac{1}{4}$	0	5	40	$\frac{1}{4}$	0	$4\frac{1}{2}$	36
$\frac{1}{2}$	0	10	80	$\frac{1}{2}$	0	9	72
1	1	2	160	1	0	18	144
2	2	4	320	2	1	16	288
3	3	6	480	3	2	14	432
4	4	8	640	4	3	12	576
5	5	10	800	5	4	10	720
6	6	12	960	6	5	8	864
7	7	14	1120	7	6	6	1008
8	8	16	1280	8	7	4	1152
9	10	0	1440	9	8	2	1296
10	11	2	1600	10	9	0	1440
11	12	4	1760	11	9	18	1584
12	13	6	1920	12	10	16	1728
13	14	8	2080	13	11	14	1872
14	15	10	2240	14	12	12	2016
15	16	12	2400	15	13	10	2160
16	17	14	2560	16	14	8	2304
17	18	16	2720	17	15	6	2448
18	20	0	2880	18	16	4	2592
19	21	2	3040	19	17	2	2736
20	22	4	3200	20	18	0	2880
21	23	6	3360	21	18	18	3024
22	24	8	3520	22	19	16	3168
23	25	10	3680	23	20	14	3312
24	26	12	3840	24	21	12	3456
25	27	14	4000	25	22	10	3600
26	28	16	4160	26	23	8	3744
27	30	0	4320	27	24	6	3888
28	31	2	4480	28	25	4	4032
29	32	4	4640	29	26	2	4176
30	33	6	4800	30	27	0	4320
31	34	8	4960	31	27	18	4464
32	35	10	5120	32	28	16	4608
33	36	12	5280	33	29	14	4752
34	37	14	5440	34	30	12	4896
35	38	16	5600	35	31	10	5040
36	40	0	5760	36	32	8	5184
37	41	2	5920	37	33	6	5328
38	42	4	6080	38	34	4	5472
39	43	6	6240	39	35	2	5616
40	44	8	6400	40	36	0	5760
41	45	10	6560	41	36	18	5904
42	46	12	6720	42	37	16	6048
43	47	14	6880	43	38	14	6192
44	48	16	7040	44	39	12	6336
45	49	18	7200	45	40	10	6480
46	51	2	7360	46	41	8	6624
47	52	4	7520	47	42	6	6768
48	53	6	7680	48	43	4	6912
49	54	8	7840	49	44	2	7056
50	55	10	8000	50	45	0	7200

TABLE VII.

Shows the relative or equivalent Weight of Straw, either by the ton of 20 cwt., or in loads weighing 11 cwt. 2 qrs. 8 lbs., or in stones of 14 lbs. Also, by the load of 11 cwt. 2 qrs. 8 lbs. in tons, cwt., qrs., lbs. ; also in stones.

tons.	loads.	truss.	lbs.	stones.	loads.	tons.	cwt.	qrs.	lbs.	stones.	lbs.
$\frac{1}{4}$	0	15	20	40	$\frac{1}{4}$	0	2	3	16	23	2
$\frac{1}{2}$	0	31	4	80	$\frac{1}{2}$	0	5	3	4	46	4
1	1	26	8	160	1	0	11	2	8	92	8
2	3	16	16	320	2	1	3	0	16	185	2
3	5	6	24	480	3	1	14	2	24	277	10
4	6	32	32	640	4	2	6	1	4	370	4
5	8	23	4	800	5	2	17	3	12	462	12
6	10	13	12	960	6	3	9	1	20	555	6
7	12	3	20	1120	7	4	1	0	0	648	0
8	13	29	28	1280	8	4	12	2	8	740	8
9	15	20	0	1440	9	5	4	0	16	833	2
10	17	10	8	1600	10	5	15	2	24	925	10
11	19	1	16	1760	11	6	7	1	4	1018	4
12	20	26	24	1920	12	6	18	3	12	1110	12
13	22	16	32	2080	13	7	10	1	20	1203	6
14	24	7	4	2240	14	8	2	0	0	1296	0
15	25	33	12	2400	15	8	13	2	8	1388	8
16	27	23	20	2560	16	9	5	0	16	1481	2
17	29	13	28	2720	17	9	16	2	24	1573	10
18	31	4	0	2880	18	10	8	1	4	1666	4
19	32	30	8	3040	19	10	19	3	12	1758	12
20	34	20	16	3200	20	11	11	1	20	1851	6
21	36	10	24	3360	21	12	3	0	0	1944	0
22	38	0	32	3520	22	12	14	2	8	2036	8
23	39	27	4	3680	23	13	6	0	16	2129	2
24	41	17	12	3840	24	13	17	2	24	2221	10
25	43	7	20	4000	25	14	9	1	4	2314	4
26	44	33	28	4160	26	15	0	3	12	2406	12
27	46	24	0	4320	27	15	12	1	20	2499	6
28	48	14	8	4480	28	16	4	0	0	2592	0
29	50	4	16	4640	29	16	15	2	8	2684	8
30	51	30	24	4800	30	17	7	0	16	2777	2
31	53	20	32	4960	31	17	18	2	24	2869	10
32	55	11	4	5120	32	18	10	1	4	2962	4
33	57	1	12	5280	33	19	1	3	12	3054	12
34	58	27	20	5440	34	19	13	1	20	3147	6
35	60	17	28	5600	35	20	5	0	0	3240	0
36	62	8	0	5760	36	20	16	2	8	3332	8
37	63	34	8	5920	37	21	8	0	16	3425	2
38	65	24	16	6080	38	21	19	2	24	3517	10
39	67	14	24	6240	39	22	11	1	4	3610	4
40	69	4	32	6400	40	23	2	3	12	3702	12
41	70	31	4	6560	41	23	14	1	20	3795	6
42	72	21	12	6720	42	24	6	0	0	3888	0
43	74	11	20	6880	43	24	17	2	8	3980	8
44	76	1	28	7040	44	25	9	0	16	4073	2
45	77	28	0	7200	45	26	0	2	24	4165	10
46	79	18	8	7360	46	26	12	1	4	4258	4
47	81	8	16	7520	47	27	3	3	12	4350	12
48	82	34	24	7680	48	27	15	1	20	4442	6
49	84	24	32	7840	49	28	7	0	0	4534	8
50	86	15	4	8000	50	28	18	2	8	4628	8

TABLE VIII.

Shows the number of cubic yards, also the number of cart-loads containing 30, 35, 40, 45, and 50 feet each, in a Clamp of Manure of any given size from 25 to 12,000 cubic feet.

	Cubic yard.		30 ft.		35 ft.		40 ft.		45 ft.		50 ft.	
Cubic ft.	yds.	ft.	lds.	ft.	lds.	ft.	lds.	ft.	lds.	ft.	lds.	ft.
25	0	25	0	25	0	25	0	25	0	25	0	25
50	1	23	1	20	1	15	1	10	1	5	1	0
75	2	21	2	15	2	5	1	35	1	30	1	25
100	3	19	3	10	2	30	2	20	2	10	2	0
150	5	15	5	0	4	10	3	30	3	15	3	0
250	9	7	8	10	7	5	6	10	5	25	5	0
500	18	14	16	20	14	10	12	20	11	5	10	0
750	27	21	25	0	21	15	18	30	16	30	15	0
1000	37	1	33	10	28	20	25	0	22	10	20	0
1250	46	8	41	20	35	25	31	10	27	35	25	0
1500	55	15	50	0	42	30	37	20	33	15	30	0
1750	64	22	58	10	50	0	43	30	38	40	35	0
2000	74	2	66	20	57	5	50	0	44	20	40	0
2250	83	9	75	0	64	10	56	10	50	0	45	0
2500	92	16	83	10	71	15	62	20	55	25	50	0
2750	101	23	91	20	78	20	68	30	61	5	55	0
3000	111	3	100	0	85	25	75	0	66	30	60	0
3250	120	10	108	10	92	30	81	10	72	10	65	0
3500	129	17	116	20	100	0	87	20	77	35	70	0
3750	138	24	125	0	107	5	93	30	83	15	75	0
4000	148	4	133	10	114	10	100	0	88	40	80	0
4250	157	11	141	20	121	15	106	10	94	20	85	0
4500	166	18	150	0	128	20	112	20	100	0	90	0
4750	175	25	158	10	135	25	118	30	105	25	95	0
5000	185	5	166	20	142	30	125	0	111	5	100	0
5250	194	12	175	0	150	0	131	10	116	30	105	0
5500	203	19	183	10	157	5	137	20	122	10	110	0
5750	212	26	191	20	164	10	143	30	127	35	115	0
6000	222	6	200	0	171	15	150	0	133	15	120	0
6250	231	13	208	10	178	20	156	10	138	40	125	0
6500	240	20	216	20	185	25	162	20	144	20	130	0
6750	250	0	225	0	192	30	168	30	150	0	135	0
7000	259	7	233	10	200	0	175	0	155	25	140	0
7250	268	14	241	20	207	5	181	10	161	5	145	0
7500	277	21	250	0	214	10	187	20	166	30	150	0
7750	287	1	258	10	221	15	193	30	172	10	155	0
8000	296	8	266	20	228	20	200	0	177	35	160	0
8250	305	15	275	0	235	25	206	10	183	15	165	0
8500	314	22	283	10	242	30	212	20	188	40	170	0
8750	324	2	291	20	250	0	218	30	194	20	175	0
9000	333	9	300	0	257	5	225	0	200	0	180	0
9250	342	16	308	10	264	10	231	10	205	25	185	0
9500	351	23	316	20	271	15	237	20	211	5	190	0
9750	361	3	325	0	278	20	243	30	216	30	195	0
10000	370	10	333	10	285	24	250	0	222	10	200	0
10250	379	17	341	20	292	30	256	10	227	35	205	0
10500	388	24	350	0	300	0	262	20	233	15	210	0
11000	407	11	366	20	314	10	275	0	244	20	220	0
11500	425	25	383	10	328	20	287	20	255	25	230	0
12000	444	12	400	0	342	30	300	0	268	30	240	0

TABLE IX.

Shows the Price of any Commodity, either by the stone of 8 lbs., by the stone of 14 lbs., by the score of 20 lbs., by the cwt. of 112 lbs., or by the ton of 20 cwt., from $\frac{1}{8}$ of a penny per lb. upwards.

Per lb.	Per 8 lbs.		Per 14 lbs.		Per 20 lbs.		Per Cwt.			Per Ton.		
d.	s.	d.	s.	d.	s.	d.	£	s.	d.	£	s.	d.
$0\frac{1}{8}$	0	1	0	$1\frac{1}{4}$	0	$2\frac{1}{2}$	0	1	2	1	3	4
$0\frac{1}{4}$	0	2	0	$3\frac{1}{2}$	0	5	0	2	4	2	6	8
$0\frac{3}{8}$	0	3	0	$5\frac{1}{4}$	0	$7\frac{1}{2}$	0	3	6	3	10	0
$0\frac{1}{2}$	0	4	0	7	0	10	0	4	8	4	13	4
$0\frac{5}{8}$	0	5	0	$8\frac{1}{4}$	1	$0\frac{1}{2}$	0	5	10	5	16	8
$0\frac{3}{4}$	0	6	0	$10\frac{1}{2}$	1	3	0	7	0	7	0	0
$0\frac{7}{8}$	0	7	1	$1\frac{1}{4}$	1	$5\frac{1}{2}$	0	8	2	8	3	4
1	0	8	1	2	1	8	0	9	4	9	6	8
$1\frac{1}{8}$	0	9	1	$3\frac{1}{4}$	1	$10\frac{1}{2}$	0	10	6	10	10	0
$1\frac{1}{4}$	0	10	1	$5\frac{1}{2}$	2	1	0	11	8	11	13	4
$1\frac{3}{8}$	0	11	1	$7\frac{1}{4}$	2	$3\frac{1}{2}$	0	12	10	12	16	8
$1\frac{1}{2}$	1	0	1	9	2	6	0	14	0	14	0	0
$1\frac{5}{8}$	1	1	1	$10\frac{3}{4}$	2	$8\frac{1}{2}$	0	15	2	15	3	4
$1\frac{3}{4}$	1	2	2	$0\frac{1}{2}$	2	11	0	16	4	16	6	8
$1\frac{7}{8}$	1	3	2	$2\frac{1}{4}$	3	$1\frac{1}{2}$	0	17	6	17	10	0
2	1	4	2	4	3	4	0	18	8	18	3	4
$2\frac{1}{8}$	1	5	2	$5\frac{1}{4}$	3	$6\frac{1}{2}$	0	19	10	19	16	8
$2\frac{1}{4}$	1	6	2	$7\frac{1}{2}$	3	9	1	1	0	21	0	0
$2\frac{3}{8}$	1	7	2	$9\frac{1}{4}$	3	$11\frac{1}{2}$	1	2	2	22	3	4
$2\frac{1}{2}$	1	8	2	11	4	2	1	3	4	23	6	8
$2\frac{5}{8}$	1	9	3	$0\frac{3}{4}$	4	$4\frac{1}{2}$	1	4	6	24	10	0
$2\frac{3}{4}$	1	10	3	$2\frac{3}{4}$	4	7	1	5	8	25	13	4
$2\frac{7}{8}$	1	11	3	$4\frac{1}{4}$	4	$9\frac{1}{2}$	1	6	10	26	16	8
3	2	0	3	6	5	0	1	8	0	28	0	0
$3\frac{1}{8}$	2	1	3	$7\frac{1}{4}$	5	$2\frac{1}{2}$	1	9	2	29	3	4
$3\frac{1}{4}$	2	2	3	$9\frac{1}{2}$	5	5	1	10	4	30	6	8
$3\frac{3}{8}$	2	3	3	$11\frac{1}{4}$	5	$7\frac{1}{2}$	1	11	6	31	10	0
$3\frac{1}{2}$	2	4	4	1	5	10	1	12	8	32	13	4
$3\frac{5}{8}$	2	5	4	$2\frac{3}{4}$	6	$0\frac{1}{2}$	1	13	10	33	16	8
$3\frac{3}{4}$	2	6	4	$4\frac{1}{2}$	6	3	1	15	0	35	0	0
$3\frac{7}{8}$	2	7	4	$6\frac{1}{4}$	6	$5\frac{1}{2}$	1	16	2	36	3	4
4	2	8	4	8	6	8	1	17	4	37	6	8
$4\frac{1}{8}$	2	9	4	$9\frac{3}{4}$	6	$10\frac{1}{2}$	1	18	6	38	10	0
$4\frac{1}{4}$	2	10	4	$11\frac{1}{2}$	7	1	1	19	8	39	13	4
$4\frac{3}{8}$	2	11	5	$1\frac{1}{4}$	7	$3\frac{1}{2}$	2	0	10	40	16	8
$4\frac{1}{2}$	3	0	5	3	7	6	2	2	0	42	0	0
$4\frac{5}{8}$	3	1	5	$4\frac{1}{4}$	7	$8\frac{1}{2}$	2	3	2	43	3	4
$4\frac{3}{4}$	3	2	5	$6\frac{1}{2}$	7	11	2	4	4	44	6	8
$4\frac{7}{8}$	3	3	5	$8\frac{1}{4}$	8	$1\frac{1}{2}$	2	5	6	45	10	0
5	3	4	5	10	8	4	2	6	8	46	13	4
$5\frac{1}{8}$	3	5	5	$11\frac{1}{2}$	8	$6\frac{1}{2}$	2	7	10	47	16	8
$5\frac{1}{4}$	3	6	6	$1\frac{3}{4}$	8	9	2	9	0	49	0	0
$5\frac{3}{8}$	3	7	6	$3\frac{1}{4}$	8	$11\frac{1}{2}$	2	10	2	50	3	4
$5\frac{1}{2}$	3	8	6	5	9	2	2	11	4	51	6	8
$5\frac{5}{8}$	3	9	6	$6\frac{3}{4}$	9	$4\frac{1}{2}$	2	12	6	52	10	0
$5\frac{3}{4}$	3	10	6	$8\frac{1}{2}$	9	7	2	13	8	53	13	4
$5\frac{7}{8}$	3	11	6	$10\frac{1}{4}$	9	$9\frac{1}{2}$	2	14	10	54	16	8
6	4	0	7	0	10	0	2	16	0	56	0	0

TABLE IX. *continued.*

Per lb.			Per 8 lbs.			Per 14 lbs.			Per 20 lbs.			Per Cwt.			Per Ton.		
d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
6 $\frac{1}{2}$	4	1	7	1 $\frac{1}{2}$	0	10	2 $\frac{1}{2}$	2	17	2	57	3	4				
6 $\frac{1}{2}$	4	2	7	3 $\frac{1}{2}$	0	10	5	2	18	4	58	6	8				
6 $\frac{1}{2}$	4	3	7	5 $\frac{1}{2}$	C	10	7 $\frac{1}{2}$	2	19	6	59	10	0				
6 $\frac{1}{2}$	4	4	7	7	0	10	10	3	0	8	60	13	4				
6 $\frac{1}{2}$	4	5	7	8 $\frac{1}{2}$	0	11	0 $\frac{1}{2}$	3	1	10	61	16	8				
6 $\frac{1}{2}$	4	6	7	10 $\frac{1}{2}$	0	11	3	3	3	0	63	0	0				
6 $\frac{1}{2}$	4	7	8	0 $\frac{1}{2}$	0	11	5 $\frac{1}{2}$	3	4	2	64	3	4				
7	4	8	8	2	0	11	8	3	5	4	65	6	8				
7 $\frac{1}{2}$	4	9	8	3 $\frac{1}{2}$	0	11	10 $\frac{1}{2}$	3	6	6	66	10	0				
7 $\frac{1}{2}$	4	10	8	5 $\frac{1}{2}$	0	12	1	3	7	8	67	13	4				
7 $\frac{1}{2}$	4	11	8	7 $\frac{1}{2}$	0	12	3 $\frac{1}{2}$	3	8	10	68	16	8				
7 $\frac{1}{2}$	5	0	8	9	0	12	6	3	10	0	70	0	0				
7 $\frac{1}{2}$	5	1	8	10 $\frac{1}{2}$	0	12	8 $\frac{1}{2}$	3	11	2	71	3	4				
7 $\frac{1}{2}$	5	2	9	0 $\frac{1}{2}$	0	12	11	3	12	4	72	6	8				
7 $\frac{1}{2}$	5	3	9	2 $\frac{1}{2}$	0	13	1 $\frac{1}{2}$	3	13	6	73	10	0				
8	5	4	9	4	0	13	4	3	14	8	74	13	4				
8 $\frac{1}{2}$	5	5	9	5 $\frac{1}{2}$	0	13	6 $\frac{1}{2}$	3	15	10	75	16	8				
8 $\frac{1}{2}$	5	6	9	7 $\frac{1}{2}$	0	13	9	3	17	0	77	0	0				
8 $\frac{1}{2}$	5	7	9	9 $\frac{1}{2}$	0	13	11 $\frac{1}{2}$	3	18	2	78	3	4				
8 $\frac{1}{2}$	5	8	9	11	0	14	2	3	19	4	79	6	8				
8 $\frac{1}{2}$	5	9	10	0 $\frac{1}{2}$	0	14	4 $\frac{1}{2}$	4	0	6	80	10	0				
8 $\frac{1}{2}$	5	10	10	2 $\frac{1}{2}$	0	14	7	4	1	8	81	13	4				
8 $\frac{1}{2}$	5	11	10	4 $\frac{1}{2}$	0	14	9 $\frac{1}{2}$	4	2	10	82	16	8				
9	6	0	10	6	0	15	0	4	4	0	84	0	0				
9 $\frac{1}{2}$	6	1	10	7 $\frac{1}{2}$	0	15	2 $\frac{1}{2}$	4	5	2	85	3	4				
9 $\frac{1}{2}$	6	2	10	9 $\frac{1}{2}$	0	15	5	4	6	4	86	6	8				
9 $\frac{1}{2}$	6	3	10	11 $\frac{1}{2}$	0	15	7 $\frac{1}{2}$	4	7	6	87	10	0				
9 $\frac{1}{2}$	6	4	11	1	0	15	10	4	8	8	88	13	4				
9 $\frac{1}{2}$	6	5	11	2 $\frac{1}{2}$	0	16	0 $\frac{1}{2}$	4	9	10	89	16	8				
9 $\frac{1}{2}$	6	6	11	4 $\frac{1}{2}$	0	16	3	4	11	0	91	0	0				
9 $\frac{1}{2}$	6	7	11	6 $\frac{1}{2}$	0	16	5 $\frac{1}{2}$	4	12	2	92	3	4				
10	6	8	11	8	0	16	8	4	13	4	93	6	8				
10 $\frac{1}{2}$	6	9	11	9 $\frac{1}{2}$	0	16	10 $\frac{1}{2}$	4	14	6	94	10	0				
10 $\frac{1}{2}$	6	10	11	11 $\frac{1}{2}$	0	17	1	4	15	8	95	13	4				
10 $\frac{1}{2}$	6	11	12	1 $\frac{1}{2}$	0	17	3 $\frac{1}{2}$	4	16	10	96	16	8				
10 $\frac{1}{2}$	7	0	12	3	0	17	6	4	18	0	98	0	0				
10 $\frac{1}{2}$	7	1	12	4 $\frac{1}{2}$	0	17	8 $\frac{1}{2}$	4	19	2	99	3	4				
10 $\frac{1}{2}$	7	2	12	6 $\frac{1}{2}$	0	17	11	5	0	4	100	6	8				
10 $\frac{1}{2}$	7	3	12	8 $\frac{1}{2}$	0	18	1 $\frac{1}{2}$	5	1	6	101	10	0				
11	7	4	12	10	0	18	4	5	2	8	102	13	4				
11 $\frac{1}{2}$	7	5	12	11 $\frac{1}{2}$	0	18	6 $\frac{1}{2}$	5	3	10	103	16	8				
11 $\frac{1}{2}$	7	6	13	1 $\frac{1}{2}$	0	18	9	5	5	0	105	0	0				
11 $\frac{1}{2}$	7	7	13	3 $\frac{1}{2}$	0	18	11 $\frac{1}{2}$	5	6	2	106	3	4				
11 $\frac{1}{2}$	7	8	13	5	0	19	2	5	7	4	107	6	8				
11 $\frac{1}{2}$	7	9	13	6 $\frac{1}{2}$	0	19	4 $\frac{1}{2}$	5	8	6	108	10	0				
11 $\frac{1}{2}$	7	10	13	8 $\frac{1}{2}$	0	19	7	5	9	8	109	13	4				
11 $\frac{1}{2}$	7	11	13	10 $\frac{1}{2}$	0	19	9 $\frac{1}{2}$	5	10	10	110	16	8				
12	8	0	14	0	1	0	0	5	12	0	112	0	0				

TABLE X.

MEASUREMENT OF TIMBER.

To find the content or solidity of round or unsquared timber.

RULE I.—Gird the piece of timber to be measured round the middle with a string, take one-fourth part of the girth, and square it, and multiply this square by the length for the solidity.

Note.—When the tree is very irregular, divide it into several lengths, and find the solidity of each part separately; all of which add together for the required content.

RULE II.—Multiply the area corresponding to the quarter girth in inches, by the length of the piece in feet, and the product will be the solid content.

Note.—It may sometimes happen that the quarter girth exceeds the limits of this table; in this case take half of it, and four times the content thus found will give the required content.

Quart. Girth.	Superficial Area.	Quart. Girth.	Superficial Area.	Quart. Girth.	Superficial Area.	Quart. Girth.	Superficial Area.
in.	ft. in. pts.	in.	ft. in. pts.	in.	ft. in. pts.	in.	ft. in. pts.
3 $\frac{1}{2}$	0 0 10	11 $\frac{1}{2}$	0 10 6	19 $\frac{1}{2}$	2 6 10	27 $\frac{1}{2}$	5 1 10
3 $\frac{3}{4}$	0 1 0	11 $\frac{3}{4}$	0 11 0	19 $\frac{3}{4}$	2 7 8	27 $\frac{3}{4}$	5 3 0
3 $\frac{1}{4}$	0 1 2	11 $\frac{1}{4}$	0 11 6	19 $\frac{1}{4}$	2 8 6	27 $\frac{1}{4}$	5 4 2
4	0 1 4	12	1 0 0	20	2 9 4	28	5 5 4
4 $\frac{1}{2}$	0 1 6	12 $\frac{1}{2}$	1 0 6	20 $\frac{1}{2}$	2 10 2	28 $\frac{1}{2}$	5 6 6
4 $\frac{3}{4}$	0 1 8	12 $\frac{3}{4}$	1 1 0	20 $\frac{3}{4}$	2 11 0	28 $\frac{3}{4}$	5 7 8
4 $\frac{1}{2}$	0 1 10	12 $\frac{1}{2}$	1 1 6	20 $\frac{1}{2}$	2 11 10	28 $\frac{1}{2}$	5 8 10
5	0 2 1	13	1 2 1	21	3 0 9	29	5 10 1
5 $\frac{1}{2}$	0 2 3	13 $\frac{1}{2}$	1 2 7	21 $\frac{1}{2}$	3 1 7	29 $\frac{1}{2}$	5 11 3
5 $\frac{3}{4}$	0 2 6	13 $\frac{3}{4}$	1 3 2	21 $\frac{3}{4}$	3 2 6	29 $\frac{3}{4}$	6 0 6
5 $\frac{1}{4}$	0 2 9	13 $\frac{1}{4}$	1 3 9	21 $\frac{1}{4}$	3 3 5	29 $\frac{1}{4}$	6 1 9
6	0 3 0	14	1 4 4	22	3 4 4	30	6 3 0
6 $\frac{1}{2}$	0 3 3	14 $\frac{1}{2}$	1 4 11	22 $\frac{1}{2}$	3 5 3	30 $\frac{1}{2}$	6 4 3
6 $\frac{3}{4}$	0 3 6	14 $\frac{3}{4}$	1 5 6	22 $\frac{3}{4}$	3 6 2	30 $\frac{3}{4}$	6 5 6
6 $\frac{1}{4}$	0 3 9	14 $\frac{1}{4}$	1 6 1	22 $\frac{1}{4}$	3 7 1	30 $\frac{1}{4}$	6 6 9
7	0 4 1	15	1 6 9	23	3 8 1	31	6 8 1
7 $\frac{1}{2}$	0 4 4	15 $\frac{1}{2}$	1 7 4	23 $\frac{1}{2}$	3 9 0	31 $\frac{1}{2}$	6 9 4
7 $\frac{3}{4}$	0 4 8	15 $\frac{3}{4}$	1 8 0	23 $\frac{3}{4}$	3 10 0	31 $\frac{3}{4}$	6 10 8
7 $\frac{1}{4}$	0 5 0	15 $\frac{1}{4}$	1 8 8	23 $\frac{1}{4}$	3 11 0	31 $\frac{1}{4}$	7 0 0
8	0 5 4	16	1 9 4	24	4 0 0	32	7 1 4
8 $\frac{1}{2}$	0 5 8	16 $\frac{1}{2}$	1 10 0	24 $\frac{1}{2}$	4 1 0	32 $\frac{1}{2}$	7 2 8
8 $\frac{3}{4}$	0 6 0	16 $\frac{3}{4}$	1 10 8	24 $\frac{3}{4}$	4 2 0	32 $\frac{3}{4}$	7 4 0
8 $\frac{1}{4}$	0 6 4	16 $\frac{1}{4}$	1 11 4	24 $\frac{1}{4}$	4 3 0	32 $\frac{1}{4}$	7 5 4
9	0 6 9	17	2 0 1	25	4 4 1	33	7 6 9
9 $\frac{1}{2}$	0 7 1	17 $\frac{1}{2}$	2 0 9	25 $\frac{1}{2}$	4 5 1	33 $\frac{1}{2}$	7 8 1
9 $\frac{3}{4}$	0 7 6	17 $\frac{3}{4}$	2 1 6	25 $\frac{3}{4}$	4 6 2	33 $\frac{3}{4}$	7 9 6
9 $\frac{1}{4}$	0 7 11	17 $\frac{1}{4}$	2 2 3	25 $\frac{1}{4}$	4 7 3	33 $\frac{1}{4}$	7 10 11
10	0 8 4	18	2 3 0	26	4 8 4	34	8 0 4
10 $\frac{1}{2}$	0 8 9	18 $\frac{1}{2}$	2 3 9	26 $\frac{1}{2}$	4 9 5	34 $\frac{1}{2}$	8 2 9
10 $\frac{3}{4}$	0 9 2	18 $\frac{3}{4}$	2 4 6	26 $\frac{3}{4}$	4 10 6	34 $\frac{3}{4}$	8 3 2
10 $\frac{1}{4}$	0 9 7	18 $\frac{1}{4}$	2 5 3	26 $\frac{1}{4}$	4 11 7	34 $\frac{1}{4}$	8 4 7
11	0 10 1	19	2 6 1	27	5 0 9	35	8 6 1

To find the solid content by this table, look in the first column for the quarter girth, in the next column for the area, which, multiplied by the length, will give the solid content required.

Example 1.—If a piece of round timber be 14 feet long, and the quarter girth 9 inches.

The content, 7 ft. 10 in. 6 pts.

Example 2.—If a piece of round timber be 28 feet long, and the quarter girth 35 inches.

The content, 90 ft. 1 in.

TABLE XI.

Shows the area and number of imperial gallons contained in square or rectangular tanks of various sizes, 12 inches deep.

Size.		Area.	Quantity.	Size.		Area.	Quantity.
ft.	ft. in.	ft. in.	gals.	ft.	ft. in.	ft. in.	gals.
1	×	3	1.5580	6	×	5 9	215.0072
1	×	6	3.1160	6	×	6 0	224.3556
1	×	9	4.6740	6	×	6 3	233.7037
1	×	1 0	6.2321	6	×	6 6	243.0519
1	×	1 3	7.7901	6	×	6 9	252.4
1	×	1 6	9.3481	7	×	5 6	239.9358
1	×	1 9	10.9061	7	×	5 9	250.8420
2	×	1 0	12.4642	7	×	6 0	261.7482
2	×	1 3	15.5802	7	×	6 3	272.6544
2	×	1 6	18.6963	7	×	6 6	283.5605
2	×	1 9	21.8123	7	×	6 9	294.4667
2	×	2 0	24.9284	7	×	7 0	305.3729
2	×	2 3	28.0444	7	×	7 3	316.2790
2	×	2 6	31.1605	7	×	7 6	327.1852
2	×	2 9	34.2765	7	×	7 9	338.0914
3	×	1 6	28.0444	8	×	6 6	324.0692
3	×	1 9	32.7185	8	×	6 9	336.5334
3	×	2 0	37.3926	8	×	7 0	348.9976
3	×	2 3	42.0666	8	×	7 3	361.4618
3	×	2 6	46.7407	8	×	7 6	373.9260
3	×	2 9	51.4148	8	×	7 9	386.3902
3	×	3 0	56.0889	8	×	8 0	398.8544
3	×	3 3	60.7629	8	×	8 3	411.3186
3	×	3 6	65.4370	8	×	8 6	423.7828
3	×	3 9	70.1111	8	×	8 9	436.2470
4	×	2 6	62.3210	9	×	7 6	420.6667
4	×	2 9	68.5531	9	×	7 9	434.6889
4	×	3 0	74.7852	9	×	8 0	448.7112
4	×	3 3	81.0173	9	×	8 3	462.7334
4	×	3 6	87.2494	9	×	8 6	476.7558
4	×	3 9	93.4815	9	×	8 9	490.7779
4	×	4 0	99.7136	9	×	9 0	504.8001
4	×	4 3	105.9457	9	×	9 3	518.8223
4	×	4 6	112.1778	9	×	9 6	532.8446
4	×	4 9	118.4099	9	×	9 9	546.8668
5	×	3 6	109.0617	10	×	8 0	498.5680
5	×	3 9	116.8518	10	×	8 6	529.7285
5	×	4 0	124.6420	10	×	9 0	560.8890
5	×	4 3	132.4321	10	×	9 6	592.0495
5	×	4 6	140.2222	10	×	10 0	623.21
5	×	4 9	148.0123	10	×	10 6	654.3705
5	×	5 0	155.8025	11	×	9 0	616.9779
5	×	5 3	163.5926	11	×	9 6	651.2544
5	×	5 6	171.3827	11	×	10 0	685.5310
5	×	5 9	179.1728	11	×	10 6	719.8075
6	×	4 6	168.2667	11	×	11 0	754.0841
6	×	4 9	177.6148	11	×	11 6	788.3606
6	×	5 0	186.9630	12	×	10 0	747.8520
6	×	5 3	196.3111	12	×	10 6	785.2446
6	×	5 6	205.6593	12	×	11 0	822.6372

TABLE XI. *continued.*

vs the area and number of imperial gallons contained in square or rectangular tanks of various sizes, 12 inches deep.

Size.	Area.		Quantity.	Size.	Area.		Quantity.
ft. in.	ft. in.		gals.	ft. in.	ft. in.		gals.
< 11 6	138 0		860·0298	19 × 19 0	361 0		2249·7881
< 12 0	144 0		897·4224	19 × 19 6	370 6		2308·9930
< 12 6	150 0		934·8150	20 × 17 6	350 0		2181·2350
< 11 0	143 0		891·1903	20 × 18 0	360 0		2243·5560
< 11 6	149 6		931·6989	20 × 18 6	370 0		2305·8770
< 12 0	156 0		972·2076	20 × 19 0	380 0		2368·1980
< 12 6	162 6		1012·7162	20 × 19 6	390 0		2430·5190
< 13 0	169 0		1053·2249	20 × 20 0	400 0		2492·8400
< 13 6	175 6		1093·7335	20 × 20 6	410 0		2555·1610
< 12 0	168 0		1046·9928	21 × 18 6	388 6		2421·1708
< 12 6	175 0		1090·6175	21 × 19 0	399 0		2486·6079
< 13 0	182 0		1134·2422	21 × 19 6	409 6		2552·0449
< 13 6	189 0		1177·8669	21 × 20 0	420 0		2617·4820
< 14 0	196 0		1221·4916	21 × 20 6	430 6		2682·9190
< 14 6	203 0		1265·1163	21 × 21 0	441 0		2748·3561
< 13 0	195 0		1215·2595	21 × 21 6	451 6		2813·7931
< 13 6	202 6		1262·0002	22 × 19 6	429 0		2673·5709
< 14 0	210 0		1308·7410	22 × 20 0	440 0		2742·1240
< 14 6	217 6		1355·4817	22 × 20 6	451 0		2810·6771
< 15 0	225 0		1402·2225	22 × 21 0	462 0		2879·2302
< 15 6	242 0		1508·1682	22 × 21 6	473 0		2947·7833
< 14 0	224 0		1395·9904	22 × 22 0	484 0		3016·3364
< 14 6	332 0		1445·8472	22 × 22 6	495 0		3084·8895
< 15 0	240 0		1495·7040	23 × 20 6	471 6		2938·4351
< 15 6	248 0		1545·5608	23 × 21 0	483 0		3010·1042
< 16 0	256 0		1595·4176	23 × 21 6	494 6		3081·7734
< 16 6	264 0		1645·2744	23 × 22 0	506 0		3153·4425
< 15 0	255 0		1589·1855	23 × 22 6	517 6		3225·1117
< 15 6	263 0		1642·1583	23 × 23 0	529 0		3296·7808
< 16 0	272 0		1695·1312	23 × 23 6	540 6		3368·4509
< 16 6	280 6		1748·1040	24 × 21 6	516 0		3215·7636
< 17 0	289 0		1801·0769	24 × 22 0	528 0		3290·5428
< 17 6	297 6		1854·0497	24 × 22 6	540 0		3365·3340
< 16 0	288 0		1794·8448	24 × 23 0	552 0		3440·1192
< 16 6	297 0		1850·9337	24 × 23 6	564 0		3514·9044
< 17 0	306 0		1907·0226	24 × 24 0	576 0		3589·6896
< 17 6	315 0		1965·1115	24 × 24 6	588 0		3664·4748
< 18 0	324 0		2019·2004	25 × 22 6	562 6		3505·5563
< 18 6	333 0		2075·2893	25 × 23 0	575 0		3583·4575
< 16 6	313 6		1953·7633	25 × 23 6	587 6		3661·3587
< 17 0	323 0		2012·9683	25 × 24 0	600 0		3739·2600
< 17 6	332 6		2072·1732	25 × 24 6	612 6		3817·1612
< 18 0	342 0		2131·3782	25 × 25 0	625 0		3895·0825
< 18 6	351 6		2190·5831				

TABLE XII.

SHOWS THE NUMBER OF IMPERIAL GALLONS CONTAINED IN TANKS OR RESERVOIRS OF A CIRCULAR, SQUARE, OR OBLONG FORM; THE CONTENT, OR CAPACITY, BEING GIVEN EITHER IN CUBIC FEET, CUBIC YARDS, OR FRENCH CUBIC METRES, FROM $\frac{1}{4}$ FOOT TO 270,000 CUBIC FEET.

On referring to Table I., p. 4, the content of a circular tank in cubic feet may be readily found; in Table II., p. 10, the content of a square or oblong tank of any given length, breadth, or depth: the *height* in these tables being reckoned the *depth* of the tank.

In Table XIII., pp. 63 and 64, the relative areas and circumferences of circular tanks of a given diameter may be found, in superficial feet, which if multiplied by any given depth will give the cubic content; and in Table XII., p. 62, the number of imperial gallons in a given number of cubic feet, cubic yards, or cubic metres, is shown.

In these tables fractions of a half-gallon, and under, are not counted; but when above half-a-gallon, they are reckoned as 1.

Quest. How many gallons will a circular tank contain, the diameter being 19 feet 5 inches, and the depth 15 feet?

Ans. 27,683 gallons.

Example.—In Table XIII., p. 64, we find the circumference, 60.9994 feet, to be equal to the diameter, 19 feet 5 inches; and if we turn to Table I., p. 7, in the first column we find the circumference, 61 feet, opposite which and under the depth, 15 feet, stands 4442 feet; you will now turn to Table XII., p. 62, and find:—

2700	cubic feet equal to	16826·677
1728	"	"	10769·073
14	"	"	87·249
<hr/>			
4442			27682 999

Within a fraction of 27,683 gallons.

Quest. How many cubic feet, and how many imperial gallons, will a tank contain, 84 feet long, 12 feet wide, and depth 5 feet 9 inches?

In Table II., p. 12, we find the breadth 12 feet, the length 84 feet, in the left-hand column; and the depth at the heads of the other columns:—

Under	5 feet stands	2040
"	$\frac{1}{2}$	"	204
"	$\frac{1}{4}$	"	102
<hr/>			
The cubic content			2346

Having found the content in cubic feet, on turning to Table XII., p. 62, will be found:—

2322	cubic feet, equal to	14470·942
24	"	"	149·570
<hr/>			
2346	Imperial gallons		14620·512

NOTE.—If the cubic content be multiplied by 6·2821 it will give the number of imperial gallons a tank contains.

TABLE XII.

Cu. ft.	Imp. Gals.	Cu. Mtrs.	Cu. ft.	Imp. Gals.	Cu. Mtrs.	Cu. ft.	Imp. Gals.	Cu. Mtrs.
1	1.558	.0071	8	49.857	.2265	18	112.178	.5097
2	3.116	.0142	9	56.089	.2548	19	118.410	.5380
3	4.674	.0212	10	62.321	.2832	20	124.642	.5663
4	6.232	.0283	11	68.558	.3115	21	130.874	.5946
5	7.790	.0354	12	74.785	.3398	22	137.106	.6229
6	9.348	.0424	13	81.017	.3681	23	143.338	.6512
7	10.906	.0495	14	87.249	.3964	24	149.570	.6795
8	12.464	.0566	15	93.482	.4247	25	155.803	.7078
9	14.022	.0636	16	99.714	.4530	26	162.035	.7361
10	15.580	.0707	17	105.946	.4814	27	168.267	.7645

Cu. yd.	Cub. ft.	Imp. gallons.	Cu. Mtrs.	Cu. yd.	Cub. ft.	Imp. gallons.	Cu. mtrs.
1	27	188.267	.7645	58	1512	9422.939	42.8127
2	54	380.534	1.5290	59	1589	9591.206	43.6773
3	81	504.800	2.2935	60	1666	9759.473	44.5418
4	108	673.067	3.0581	61	1743	9927.739	45.4063
5	135	841.334	3.8226	62	1820	10096.006	46.2708
6	162	1009.601	4.5871	63	1897	10264.273	47.1353
7	189	1177.867	5.3516	64	1974	10432.540	47.9998
8	216	1346.134	6.1161	65	2051	10600.808	48.8643
9	243	1514.401	6.8806	66	2128	10769.075	49.7288
10	270	1682.667	7.6451	67	2205	10937.340	50.5933
11	297	1850.934	8.4096	68	2282	11105.607	51.4578
12	324	2019.201	9.1742	69	2359	11273.873	52.3223
13	351	2187.468	9.9387	70	2436	11442.140	53.1868
14	378	2355.735	10.7032	71	2513	11610.407	54.0513
15	405	2524.002	11.4677	72	2590	11778.674	54.9158
16	432	2692.268	12.2322	73	2667	11946.941	55.7803
17	459	2860.535	12.9967	74	2744	12115.207	56.6448
18	486	3028.802	13.7612	75	2821	12283.474	57.5093
19	513	3197.069	14.5257	76	2898	12451.741	58.3738
20	540	3365.335	15.2903	77	2975	12620.008	59.2383
21	567	3533.602	16.0548	78	3052	12788.274	60.1028
22	594	3701.869	16.8193	79	3129	12956.541	60.9673
23	621	3870.136	17.5838	80	3206	13124.808	61.8318
24	648	4038.402	18.3483	81	3283	13293.075	62.6963
25	675	4206.669	19.1128	82	3360	13461.341	63.5608
26	702	4374.936	19.8773	83	3437	13629.608	64.4253
27	729	4543.203	20.6418	84	3514	13797.875	65.2898
28	756	4711.470	21.4064	85	3591	13966.142	66.1543
29	783	4879.736	22.1709	86	3668	14134.408	67.0188
30	810	5048.003	22.9354	87	3745	14302.675	67.8833
31	837	5216.270	23.7000	88	3822	14470.942	68.7478
32	864	5384.537	24.4644	89	3899	14639.209	69.6123
33	891	5552.803	25.2289	90	3976	14807.476	70.4768
34	918	5721.070	25.9934	91	4053	14975.742	71.3413
35	945	5889.337	26.7580	92	4130	15144.009	72.2058
36	972	6057.604	27.5225	93	4207	15312.276	73.0703
37	1009	6225.870	28.2870	94	4284	15480.543	73.9348
38	1036	6394.137	29.0515	95	4361	15648.809	74.7993
39	1063	6562.404	29.8160	96	4438	15817.076	75.6638
40	1090	6730.671	30.5805	97	4515	15985.343	76.5283
41	1117	6898.938	31.3450	98	4592	16153.610	77.3928
42	1144	7067.204	32.1095	99	4669	16321.877	78.2573
43	1171	7235.471	32.8741	100	4746	16490.143	79.1218
44	1198	7403.738	33.6386	101	4823	16658.410	80.0000
45	1225	7572.005	34.4031	102	4900	16826.677	80.8782
46	1252	7740.271	35.1676	103	4977	16994.944	81.7564
47	1279	7908.538	35.9321	104	5054	17163.211	82.6346
48	1306	8076.805	36.6966	105	5131	17331.478	83.5128
49	1333	8245.072	37.4612	106	5208	17500.000	84.3910
50	1360	8413.338	38.2257	107	5285	17668.522	85.2692
51	1387	8581.605	38.9902	108	5362	17837.044	86.1474
52	1414	8749.872	39.7547	109	5439	18005.566	87.0256
53	1441	8918.139	40.5192	110	5516	18174.088	87.9038
54	1468	9086.406	41.2837	111	5593	18342.610	88.7820
55	1495	9254.673	42.0482	112	5670	18511.132	89.6602

TABLE XIII.

RELATIVE AREAS AND CIRCUMFERENCES OF CIRCLES OF A GIVEN DIAMETER.

Diam.	Area.	Circum.	Diam.	Area.	Circum.	Diam.	Area.	Circum.
ft. in.			ft. in.			ft. in.		
1 0	·7854	3·1416	5 0	19·6350	15·7080	9 0	63·6174	28·2744
1 1	·9217	3·4034	1	20·2947	15·9698	1	64·8006	28·5362
2	1·0690	3·6652	2	20·9656	16·2316	2	65·9951	28·7980
3	1·2271	3·9270	3	21·6475	16·4934	3	67·2007	29·0598
4	1·3962	4·1888	4	22·3400	16·7552	4	68·4166	29·3216
5	1·5761	4·4506	5	23·0437	17·0170	5	69·6440	29·5834
6	1·7671	4·7124	6	23·7583	17·2788	6	70·8823	29·8452
7	1·9689	4·9742	7	24·4835	17·5406	7	72·1309	30·1070
8	2·1816	5·2360	8	25·2199	17·8024	8	73·3910	30·3688
9	2·4052	5·4978	9	25·9672	18·0642	9	74·6620	30·6306
10	2·6398	5·7596	10	26·7251	18·3260	10	75·9433	30·8924
11	2·8852	6·0214	11	27·4943	18·5878	11	77·2362	31·1542
2 0	3·1416	6·2832	6 0	28·2744	18·8496	10 0	78·5400	31·4160
1	3·4087	6·5450	1	29·0649	19·1114	1	79·8540	31·6778
2	3·6869	6·8068	2	29·8668	19·3732	2	81·1795	31·9396
3	3·9760	7·0686	3	30·6796	19·6350	3	82·5160	32·2014
4	4·2760	7·3304	4	31·5029	19·8968	4	83·8627	32·4632
5	4·5869	7·5922	5	32·3376	20·1586	5	85·2211	32·7250
6	4·9087	7·8540	6	33·1831	20·4204	6	86·5903	32·9868
7	5·2413	8·1158	7	34·0391	20·6822	7	87·9697	33·2486
8	5·5850	8·3776	8	34·9065	20·9440	8	89·3608	33·5104
9	5·9395	8·6394	9	35·7847	21·2058	9	90·7627	33·7722
10	6·3049	8·9012	10	36·6735	21·4676	10	92·1749	34·0340
11	6·6813	9·1630	11	37·5736	21·7294	11	93·5986	34·2958
3 0	7·0686	9·4248	7 0	38·4846	21·9912	11 0	95·0334	34·5576
1	7·4666	9·6866	1	39·4060	22·2530	1	96·4783	34·8194
2	7·8757	9·9484	2	40·3388	22·5148	2	97·9347	35·0812
3	8·2957	10·2102	3	41·2825	22·7766	3	99·4021	35·3430
4	8·7265	10·4720	4	42·2367	23·0384	4	100·8797	35·6048
5	9·1683	10·7338	5	43·2022	23·3002	5	102·3689	35·8666
6	9·6211	10·9956	6	44·1787	23·5620	6	103·8691	36·1284
7	10·0846	11·2574	7	45·1656	23·8238	7	105·3794	36·3902
8	10·5591	11·5192	8	46·1638	24·0856	8	106·9013	36·6520
9	11·0446	11·7810	9	47·1730	24·3474	9	108·4342	36·9138
10	11·5409	12·0428	10	48·1926	24·6092	10	109·9772	37·1756
11	12·0481	12·3046	11	49·2236	24·8710	11	111·5319	37·4374
4 0	12·5664	12·5664	8 0	50·2656	25·1328	12 0	113·0976	37·6992
1	13·0952	12·8282	1	51·3178	25·3946	1	114·6732	37·9610
2	13·6353	13·0900	2	52·3816	25·6564	2	116·2607	38·2228
3	14·1862	13·3518	3	53·4562	25·9182	3	117·8590	38·4846
4	14·7479	13·6136	4	54·5412	26·1800	4	119·4674	38·7464
5	15·3206	13·8754	5	55·6377	26·4418	5	121·0876	39·0082
6	15·9043	14·1372	6	56·7451	26·7036	6	122·7187	39·2700
7	16·4986	14·3990	7	57·8028	26·9654	7	124·3598	39·5318
8	17·1041	14·6608	8	58·9920	27·2272	8	126·0127	39·7936
9	17·7205	14·9226	9	60·1321	27·4890	9	127·6765	40·0554
10	18·3476	15·1844	10	61·2826	27·7508	10	129·3504	40·3172
11	18·9858	15·4462	11	62·4445	28·0126	11	131·0360	40·5790

TABLE XIII. *continued.*

RELATIVE AREAS AND CIRCUMFERENCES OF CIRCLES OF A GIVEN DIAMETER.

Diam.	Area.	Circum.	Diam.	Area.	Circum.	Diam.	Area.	Circum.
ft. in.			ft. in.			ft. in.		
13 0	132.7326	40.8408	17 0	226.9806	53.4072	21 0	346.3614	65.9736
1	134.4391	41.1326	1	229.2105	53.6690	1	349.1147	66.2354
2	136.1574	41.3644	2	231.4525	53.9308	2	351.8804	66.4972
3	137.8867	41.6262	3	233.7055	54.1926	3	354.6571	66.7590
4	139.6260	41.8880	4	235.9682	54.4544	4	357.4432	67.0208
5	141.3771	42.1498	5	238.2430	54.7162	5	360.2417	67.2826
6	143.1391	42.4116	6	240.5287	54.9780	6	363.0511	67.5444
7	144.9111	42.6734	7	242.8241	55.2398	7	365.8698	67.8062
8	146.6949	42.9352	8	245.1316	55.5016	8	368.7011	68.0680
9	148.4896	43.1970	9	247.4500	55.7634	9	371.5432	68.3298
10	150.2943	43.4588	10	249.7781	56.0252	10	374.3947	68.5916
11	152.1109	43.7206	11	252.1184	56.2870	11	377.2587	68.8534
14 0	153.9384	43.6824	18 0	254.4696	56.5488	22 0	380.1336	69.1152
1	155.7758	44.2442	1	256.8303	56.8106	1	383.0177	69.3770
2	157.6250	44.5060	2	259.2033	57.0724	2	385.9144	69.6388
3	159.4852	44.7678	3	261.5872	57.3342	3	388.8220	69.9006
4	161.3553	45.0296	4	263.9807	57.5960	4	391.7380	70.1624
5	163.2373	45.2914	5	266.3864	57.8578	5	394.6683	70.4242
6	165.1303	45.5532	6	268.8031	58.1196	6	397.6087	70.6860
7	167.0231	45.8150	7	271.2293	58.3814	7	400.5583	70.9478
8	168.9479	46.0768	8	273.6678	58.6432	8	403.5204	71.2096
9	170.8735	46.3386	9	276.1171	58.9050	9	406.4935	71.4714
10	172.8091	46.6004	10	278.5761	59.1668	10	409.4759	71.7332
11	174.7565	46.8622	11	281.0472	59.4286	11	412.4707	71.9950
15 0	176.7150	47.1240	19 0	283.5294	59.6904	23 0	415.4766	72.2568
1	178.6832	47.3858	1	286.0210	59.9522	1	418.4915	72.5186
2	180.6634	47.6476	2	288.5249	60.2140	2	421.5192	72.7804
3	182.6545	47.9094	3	291.0397	60.4758	3	424.5577	73.0422
4	184.6555	48.1712	4	293.5641	60.7376	4	427.6055	73.3040
5	186.6684	48.4330	5	296.1007	60.9994	5	430.6658	73.5658
6	188.6923	48.6948	6	298.6483	61.2612	6	433.7371	73.8276
7	190.7260	48.9566	7	301.2054	61.5230	7	436.8175	74.0894
8	192.7716	49.2184	8	303.7747	61.7848	8	439.9106	74.3512
9	194.8282	49.4802	9	306.3550	62.0466	9	443.0146	74.6130
10	196.8946	49.7420	10	308.9448	62.3084	10	446.1278	74.8748
11	198.9730	50.0038	11	311.5469	62.5702	11	449.2536	75.1366
16 0	201.0624	50.2656	20 0	314.1600	62.8320	24 0	452.3904	75.3984
1	203.1615	50.5274	1	316.7824	63.0938	1	455.5362	75.6602
2	205.2726	50.7892	2	319.4173	63.3556	2	458.6948	75.9220
3	207.3946	51.0510	3	322.0630	63.6174	3	461.8642	76.1838
4	209.5264	51.3128	4	324.7182	63.8792	4	465.0428	76.4456
5	211.6703	51.5746	5	327.3858	64.1410	5	468.2341	76.7074
6	213.8251	51.8364	6	330.0643	64.4028	6	471.4363	76.9692
7	215.9896	52.0982	7	332.7522	64.6646	7	474.6476	77.2310
8	218.1662	52.3600	8	335.4525	64.9264	8	477.8716	77.4928
9	220.3537	52.6218	9	338.1637	65.1882	9	481.1065	77.7546
10	222.5510	52.8836	10	340.8844	65.4500	10	484.3506	78.0164
11	224.7603	53.1454	11	343.6174	65.7118	11	487.6073	78.2782

TABLE XIV.
READY RECKONER.

Income by

Day.		Week.			Lunar Month.			Calendar Month.			Year.		
s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
0	0	0	0	1	0	0	7	0	0	7	0	7	7
0	0	0	0	3	0	1	2	0	1	3	0	15	2
0	0	0	0	5	0	1	9	0	1	10	1	2	9
0	1	0	0	7	0	2	4	0	2	6	1	10	5
0	2	0	1	2	0	4	8	0	5	0	3	0	10
0	3	0	1	9	0	7	0	0	7	7	4	11	3
0	4	0	2	4	0	9	4	0	10	2	6	1	8
0	5	0	2	11	0	11	8	0	12	8	7	12	1
0	6	0	3	6	0	14	0	0	15	3	9	2	6
0	7	0	4	1	0	16	4	0	17	9	10	12	11
0	8	0	4	8	0	18	8	1	0	3	12	3	4
0	9	0	5	3	1	1	0	1	2	10	13	13	9
0	10	0	5	10	1	3	4	1	5	4	15	4	2
0	11	0	6	5	1	5	8	1	7	10	16	14	7
1	0	0	7	0	1	8	0	1	10	5	18	5	0
1	3	0	8	9	1	15	0	1	18	0	22	16	3
1	6	0	10	6	2	2	0	2	5	7	27	7	6
1	9	0	12	3	2	9	0	2	13	3	31	18	9
2	0	0	14	0	2	16	0	3	0	10	36	10	0
2	3	0	15	9	3	3	0	3	8	5	41	1	3
2	6	0	17	6	3	10	0	3	16	0	45	12	6
2	9	0	19	3	3	17	0	4	3	8	50	3	9
3	0	1	1	0	4	4	0	4	11	3	54	15	0
3	3	1	2	9	4	11	0	4	18	10	59	6	3
3	6	1	4	6	4	18	0	5	6	6	63	17	6
3	9	1	6	3	5	5	0	5	14	1	68	18	9
4	0	1	8	0	5	12	0	6	1	8	73	0	0
4	3	1	9	9	5	19	0	6	9	3	77	11	3
4	6	1	11	6	6	6	0	6	16	10	82	2	6
4	9	1	13	3	6	13	0	7	4	6	86	13	9
5	0	1	15	0	7	0	0	7	12	1	91	5	0
5	3	1	16	9	7	7	0	7	19	8	95	16	3
5	6	1	18	6	7	14	0	8	7	3	100	7	6
5	9	2	0	3	8	1	0	8	14	11	104	18	9
6	0	2	2	0	8	8	0	9	2	6	109	10	0
6	3	2	3	9	8	15	0	9	10	1	114	1	3
6	6	2	5	6	9	2	0	9	17	9	118	12	6
6	9	2	7	3	9	9	0	10	5	4	123	3	9
7	0	2	9	0	9	16	0	10	12	11	127	15	0
7	3	2	10	9	10	3	0	11	0	6	132	6	3
7	6	2	12	6	10	10	0	11	8	2	136	17	6
8	0	2	16	0	11	4	0	12	3	4	146	0	0
8	6	2	18	6	11	14	0	12	18	6	155	2	6
9	0	3	3	0	12	12	0	13	13	9	164	5	0
9	6	3	6	6	13	6	0	14	9	0	173	7	6
10	0	3	10	0	14	0	0	15	4	2	182	10	0
10	6	3	13	6	14	14	0	15	19	4	191	12	6
11	0	3	17	0	15	3	0	16	14	7	200	15	0
11	6	4	0	6	16	2	0	17	19	10	209	17	6
12	0	4	4	0	16	16	0	18	5	0	219	0	0

TABLE XV.

Showing the Weight of any Substance produced upon an Acre of
calculated from a $\frac{1}{4}$ lb. to 28 lbs. per square yard.

Square Yard.	Weight per Acre.	Square Yard.	Weight per Acre.	Square Yard.	Weight per
lbs.	Tons. Cwts. Qrs. Lbs.	lbs.	Tons. Cwts. Qrs. Lbs.	lbs.	Tons. Cwts. Qrs. Lbs.
$\frac{1}{4}$	0 10 3 6	$9\frac{3}{4}$	21 1 1 10	$19\frac{1}{4}$	41 11 1
$\frac{1}{2}$	1 1 2 12	10	21 12 0 16	$19\frac{1}{2}$	42 2
$\frac{3}{4}$	1 12 1 18	$10\frac{1}{4}$	22 2 3 22	$19\frac{3}{4}$	42 13
1	2 3 0 24	$10\frac{1}{2}$	22 13 2 0	20	43 4
$1\frac{1}{4}$	2 14 0 2	$10\frac{3}{4}$	23 4 1 6	$20\frac{1}{4}$	43 15
$1\frac{1}{2}$	3 4 3 8	11	23 15 1 12	$20\frac{1}{2}$	44 5
$1\frac{3}{4}$	3 15 2 14	$11\frac{1}{4}$	24 6 0 18	$20\frac{3}{4}$	44 16
2	4 6 1 20	$11\frac{1}{2}$	24 16 3 24	21	45 7
$2\frac{1}{4}$	4 17 0 26	$11\frac{3}{4}$	25 7 3 2	$21\frac{1}{4}$	45 18
$2\frac{1}{2}$	5 8 0 4	12	25 18 2 8	$21\frac{1}{2}$	46 9
$2\frac{3}{4}$	5 18 3 10	$12\frac{1}{4}$	26 9 1 14	$21\frac{3}{4}$	46 19
3	6 9 2 16	$12\frac{1}{2}$	27 0 0 20	22	47 10
$3\frac{1}{4}$	7 0 1 22	$12\frac{3}{4}$	27 10 3 26	$22\frac{1}{4}$	48 1
$3\frac{1}{2}$	7 11 1 0	13	28 1 3 4	$22\frac{1}{2}$	48 12
$3\frac{3}{4}$	8 2 0 6	$13\frac{1}{4}$	28 12 2 10	$22\frac{3}{4}$	49 3
4	8 12 3 12	$13\frac{1}{2}$	29 3 1 16	23	49 13
$4\frac{1}{4}$	9 3 2 18	$13\frac{3}{4}$	29 14 0 22	$23\frac{1}{4}$	50 4
$4\frac{1}{2}$	9 14 1 24	14	30 5 0 0	$23\frac{1}{2}$	50 15
$4\frac{3}{4}$	10 5 1 2	$14\frac{1}{4}$	30 15 3 6	$23\frac{3}{4}$	51 6
5	10 16 0 8	$14\frac{1}{2}$	31 6 2 12	24	51 17
$5\frac{1}{4}$	11 6 3 14	$14\frac{3}{4}$	31 17 1 18	$24\frac{1}{4}$	52 7
$5\frac{1}{2}$	11 17 2 20	15	32 8 0 24	$24\frac{1}{2}$	52 18
$5\frac{3}{4}$	12 8 1 26	$15\frac{1}{4}$	32 19 0 2	$24\frac{3}{4}$	53 9
6	12 19 1 4	$15\frac{1}{2}$	33 9 3 8	25	54 0
$6\frac{1}{4}$	13 10 0 10	$15\frac{3}{4}$	34 0 2 14	$25\frac{1}{4}$	54 11
$6\frac{1}{2}$	13 0 3 16	16	34 11 1 20	$25\frac{1}{2}$	55 1
$6\frac{3}{4}$	14 11 2 22	$16\frac{1}{4}$	35 2 0 26	$25\frac{3}{4}$	55 12
7	15 2 2 0	$16\frac{1}{2}$	35 13 0 4	26	56 3
$7\frac{1}{4}$	15 13 1 6	$16\frac{3}{4}$	36 3 3 10	$26\frac{1}{4}$	56 14
$7\frac{1}{2}$	16 4 0 12	17	36 14 2 16	$26\frac{1}{2}$	57 5
$7\frac{3}{4}$	16 14 3 18	$17\frac{1}{4}$	37 5 1 22	$26\frac{3}{4}$	57 15
8	17 5 2 24	$17\frac{1}{2}$	37 16 1 0	27	58 6
$8\frac{1}{4}$	17 16 2 2	$17\frac{3}{4}$	38 7 0 6	$27\frac{1}{4}$	58 17
$8\frac{1}{2}$	18 7 1 8	18	38 17 3 12	$27\frac{1}{2}$	59 8
$8\frac{3}{4}$	18 18 0 14	$18\frac{1}{4}$	39 8 2 18	$27\frac{3}{4}$	59 19
9	19 8 3 20	$18\frac{1}{2}$	39 19 1 24	28	60 10
$9\frac{1}{4}$	19 19 2 26	$18\frac{3}{4}$	40 10 1 2		
$9\frac{1}{2}$	20 10 2 4	19	41 1 0 8		

Example.—If a square yard of Turnips weigh $8\frac{1}{2}$ lbs., find that w the first column, opposite to which is 18 tons 7 cwt. 1 qr. 8 lbs., the of an acre.

N.B.—As a square yard is but a small portion of an acre, it would b to take a nine-foot pole, and measure a square of nine feet; weigh the and divide it by nine, and you will have the weight of a square y that weight in the first column, opposite to which is the weight of a

TABLE XVI.

Showing the cubical contents of each rod (16½ feet in length) in drains or ditches of various dimensions.

Depth. Inches.	Mean width.											
	7-in.	8-in.	9-in.	10-in.	11-in.	12-in.	13-in.	14-in.	15-in.	16-in.	17-in.	18-in.
30	.89	1.02	1.15	1.27	1.40	1.53	1.66	1.78	1.91	2.04	2.16	2.29
33	.98	1.12	1.26	1.40	1.54	1.68	1.82	1.96	2.10	2.24	2.38	2.52
36	1.06	1.22	1.38	1.53	1.68	1.83	1.99	2.14	2.29	2.34	2.60	2.75
39	1.16	1.32	1.49	1.66	1.82	1.99	2.15	2.32	2.48	2.65	2.81	2.98
42	1.25	1.43	1.60	1.78	1.96	2.14	2.32	2.50	2.67	2.85	3.03	3.21
45	1.34	1.53	1.72	1.91	2.10	2.29	2.48	2.67	2.86	3.05	3.24	3.43
48	1.43	1.64	1.83	2.04	2.22	2.44	2.65	2.85	3.05	3.26	3.46	3.66
51	1.52	1.73	1.95	2.16	2.38	2.60	2.81	3.03	3.25	3.46	3.68	3.89
54	1.60	1.83	2.06	2.29	2.52	2.75	2.98	3.20	3.44	3.66	3.89	4.12
57	1.69	1.94	2.18	2.42	2.66	2.90	3.14	3.38	3.63	3.87	4.11	4.35
60	1.78	2.04	2.29	2.55	2.80	3.06	3.31	3.56	3.82	4.07	4.33	4.58

In making use of this Table it is necessary to find the mean or average width of the drain, from the widths at the top and bottom. Thus, if a drain 48 inches deep were 26 inches wide at the top and 8 inches at the bottom, the mean width would be a half of 26 and 8 added together—17 inches, then by looking in the Table to the right for the column 17 inches (width), opposite 48 inches (depth), we find the number of cubic yards in each rod (5½ yards) to be 3.46, or 3½ cubic yards.

TABLE XVII.

LAND MEASURE—(PARALLELOGRAMS).

Showing the several lengths and breadths which are equal to an acre of land, advancing by links.

Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.
1	100000	51	1960·784	101	990·0990	151	662·2516
2	50000	52	1923·076	102	980·3921	152	667·8947
3	33333·3	53	1886·792	103	970·8737	153	653·5947
4	25000	54	1851·851	104	961·5384	154	649·3506
5	20000	55	1818·181	105	952·3809	155	645·1612
6	16666·6	56	1785·714	106	943·3962	156	641·0256
7	14285·714	57	1754·385	107	934·5794	157	636·9426
8	12500	58	1724·137	108	925·9259	158	632·9113
9	11111·111	59	1694·915	109	917·4311	159	628·9308
10	10000	60	1666·666	110	909·0909	160	625
11	9090·909	61	1639·344	111	900·9009	161	621·1180
12	8333·333	62	1612·903	112	892·8571	162	617·2889
13	7692·307	63	1587·301	113	884·9557	163	613·4969
14	7142·857	64	1562·5	114	877·1929	164	609·7560
15	6666·666	65	1538·4615	115	869·5652	165	606·0606
16	6250	66	1515·151	116	862·0689	166	602·4096
17	5882·353	67	1492·537	117	854·7008	167	598·8023
18	5555·555	68	1470·588	118	847·4576	168	595·2380
19	5263·159	69	1449·275	119	840·3361	169	591·6156
20	5000	70	1428·571	120	833·3333	170	588·2352
21	4671·948	71	1408·450	121	826·4462	171	584·7953
22	4545·454	72	1388·888	122	819·6721	172	581·3978
23	4347·826	73	1369·867	123	813·0081	173	578·0346
24	4166·666	74	1351·351	124	806·4516	174	574·7126
25	4000	75	1333·333	125	800	175	571·4286
26	3896·154	76	1315·788	126	793·6507	176	568·1818
27	3703·704	77	1298·701	127	787·4015	177	564·9717
28	3571·429	78	1282·805	128	781·25	178	561·7977
29	3448·276	79	1265·822	129	775·1937	179	558·6592
30	3333·333	80	1250	130	769·2307	180	555·5555
31	3225·806	81	1234·567	131	763·3587	181	552·4861
32	3125	82	1219·512	132	757·5757	182	549·4505
33	3030·303	83	1204·818	133	751·8796	183	546·4480
34	2941·177	84	1190·476	134	746·2686	184	543·4783
35	2857·143	85	1176·470	135	740·7407	185	540·5405
36	2777·777	86	1162·795	136	735·2941	186	537·6344
37	2702·270	87	1149·425	137	729·9270	187	534·7593
38	2631·579	88	1136·363	138	724·6376	188	531·9148
39	2564·125	89	1123·595	139	719·4244	189	529·1005
40	2500	90	1111·111	140	714·2857	190	526·3157
41	2439·024	91	1098·010	141	709·2198	191	523·5602
42	2380·952	92	1086·956	142	704·2253	192	520·8333
43	2325·581	93	1075·268	143	699·3006	193	518·1347
44	2272·627	94	1063·829	144	694·4444	194	515·4587
45	2222·222	95	1052·631	145	689·6551	195	512·8205
46	2173·913	96	1041·666	146	684·9335	196	510·2040
47	2127·659	97	1030·917	147	680·2721	197	507·6142
48	2083·333	98	1020·408	148	675·6756	198	505·0505
49	2040·816	99	1010·101	149	671·1409	199	502·5125
50	2000	100	1000	150	666·6666	200	500

TABLE XVII. *continued.*

LAND MEASURE—(PARALLELOGRAMS).

Showing the several lengths and breadths which are equal to an acre of land, advancing by links.

Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.
201	497·5124	251	398·4063	301	332·2259	351	284·9002·
202	495·0495	252	396·8253·	302	331·1258	352	284·0909
203	492·6108	253	395·2569	303	330·0330	353	283·2861
204	490·1960·	254	393·7007·	304	328·9472	354	282·4858·
205	487·8048·	255	392·1568·	305	327·8688·	355	281·6901
206	485·4368·	256	390·625	306	326·7973·	356	280·8988·
207	483·0917·	257	389·1050·	307	325·7328·	357	280·1120
208	480·7694	258	387·5968·	308	324·6753	358	279·3296
209	478·4689	259	386·1003·	309	323·6245·	359	278·5515
210	476·1904·	260	384·6153·	310	322·5806	360	277·7777·
211	473·9336	261	383·1417	311	321·5434	361	277·0083
212	471·6981	262	381·6793·	312	320·5128	362	276·2430
213	469·4835	263	380·2281	313	319·4888	363	275·4820
214	467·2897	264	378·7878·	314	318·4713	364	274·7252·
215	465·1162	265	377·358	315	317·4603	365	273·9726
216	462·9629·	266	375·9398	316	316·4556·	366	273·2240
217	460·8294	267	374·5318	317	315·4574	367	272·4795·
218	458·7155·	268	373·1343	318	314·4654	368	271·7391·
219	456·6210	269	371·7472	319	313·4796	369	271·0027
220	454·5454·	270	370·	320	312·5	370	270·2702
221	452·4886·	271	369·0036·	321	311·5264	371	269·5477
222	450·4504·	272	367·6470	322	310·5590	372	268·8172
223	448·4304·	273	366·6666·	323	309·5975	373	268·0965
224	446·4285·	274	364·9635	324	308·6444	374	267·3796
225	444·4444	275	363·6363·	325	307·6923	375	266·6666·
226	442·4778	276	362·3188	326	306·7484·	376	265·9574
227	440·5286	277	361·0108	327	305·8103·	377	265·2519·
228	438·5964·	278	359·7122	328	304·8780	378	264·5502·
229	436·6812	279	358·4229	329	303·9513·	379	263·8522
230	434·7826	280	357·1428·	330	303·0303	380	263·1578·
231	432·9004	281	355·8718·	331	302·1148	381	262·4671
232	431·0344·	282	354·6099	332	301·2048	382	261·7801
233	429·1815	283	353·3568·	333	300·3003	383	261·0966
234	427·3504	284	352·1126·	334	299·4011·	384	260·4166·
235	425·5310	285	350·8771·	335	298·5074·	385	259·7402·
236	423·7288	286	349·6503	336	297·6190	386	259·0673·
237	421·9409	287	348·4302	337	296·7359	387	258·3979
238	420·1680·	288	347·2222	338	295·8578·	388	257·7293·
239	418·4100	289	346·0207·	339	294·9852·	389	257·0694
240	416·6666·	290	344·8275·	340	294·1176	390	256·4102·
241	414·9377·	291	343·6426	341	293·2551	391	255·7544·
242	413·2231·	292	342·4667·	342	292·3976·	392	255·1020·
243	411·5226·	293	341·2969	343	291·5451·	393	254·4529
244	409·8360·	294	340·1360·	344	290·6989	394	253·8071
245	408·1632·	295	338·9835	345	289·8550	395	253·1645·
246	406·5040·	296	337·8378	346	289·0173	396	252·5252·
247	404·8583	297	336·7003	347	288·1844	397	251·8891
248	403·2258	298	335·5704·	348	287·3563	398	251·2582·
249	401·6064	299	334·4481·	349	286·5329	399	250·6385·
250	400·	300	333·3333	350	285·7142·	400	250·

TABLE XVII. *continued.*

LAND MEASURE—(PARALLELOGRAMS).

Showing the several lengths and breadths which are equal to an acre of land, advancing by links.

Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.
401	249·3765·	451	221·7295	501	199·7647·	551	181·4882
402	248·7562	452	221·2389	502	199·2031·	552	181·1594
403	248·1389	453	220·7505	503	198·8071·	553	180·8318
404	247·5247·	454	220·2643	504	198·4127·	554	180·5054
405	246·9135·	455	219·7800	505	198·0198	555	180·1801·
406	246·3054	456	219·2982	506	197·6284·	556	179·8561
407	245·7002	457	218·8185	507	197·2386·	557	179·5332
408	245·0980	458	218·3406	508	196·8503·	558	179·2114·
409	244·4987·	459	217·8640	509	196·4636·	559	178·8908·
410	243·9024	460	217·3913	510	196·0784	560	178·5714
411	243·3090	461	216·9197	511	195·6947	561	178·2531
412	242·7184	462	216·4502	512	195·3125	562	177·8359
413	242·1307·	463	215·9827	513	194·9317·	563	177·6198·
414	241·5458·	464	215·5172	514	194·5525	564	177·3049·
415	240·9638·	465	215·0538	515	194·1747·	565	176·9911·
416	240·3847	466	214·5922·	516	193·7984·	566	176·6784
417	239·8081	467	214·1328	517	193·4235·	567	176·5255·
418	239·2344·	468	213·6752	518	193·0051·	568	176·0563
419	238·6635·	469	213·2196	519	192·6782	569	175·7469
420	238·0952	470	212·7659·	520	192·3076·	570	175·4385·
421	237·5296	471	212·3142	521	191·9385·	571	175·1313
422	236·9663	472	211·8644	522	191·5708·	572	174·8251·
423	236·4066	473	211·4165	523	191·2045·	573	174·5200·
424	235·8490·	474	210·9704·	524	190·8396·	574	174·2151·
425	235·2941	475	210·5263	525	190·4761·	575	173·9130·
426	234·7417·	476	210·0840	526	190·1140·	576	173·6111·
427	234·1920	477	209·6436	527	189·7533	577	173·3102
428	233·6448·	478	209·2050	528	189·3939	578	173·0103·
429	233·1002	479	208·7682	529	189·0359	579	172·7115·
430	232·5581	480	208·3333	530	188·6792	580	172·4138·
431	232·1856	481	207·9002	531	188·3239	581	172·1170
432	231·4814·	482	207·4688·	532	187·9699	582	171·8213
433	230·9469	483	207·0393	533	187·6172	583	171·5265
434	230·4147	484	206·6130·	534	187·2659	584	171·2333
435	229·8850	485	206·1855	535	186·9158·	585	170·9401·
436	229·3577·	486	205·7613	536	186·5671·	586	170·6484·
437	228·8329	487	205·3388	537	186·2197	587	170·3577·
438	228·3105	488	204·9180	538	185·8736	588	170·0680
439	227·7904	489	204·4989	539	185·5287·	589	169·7792·
440	227·2727	490	204·0816	540	185·1851·	590	169·4917·
441	226·7574	491	203·6659	541	184·8428·	591	169·2047
442	226·2443	492	203·2520	542	184·5018	592	168·9189
443	225·7336	493	202·8397·	543	184·1620·	593	168·6340·
444	225·2252	494	202·4291·	544	183·8235	594	168·3501·
445	224·7191	495	202·0202	545	183·4862	595	168·0672
446	224·2152	496	201·6129	546	183·3333	596	167·7852
447	223·7136	497	201·2072	547	182·8153·	597	167·5041·
448	223·2142	498	200·8032	548	182·4817·	598	167·2240·
449	222·7171	499	200·4008	549	182·1493·	599	166·9449
450	222·2222	500	200·	550	181·8181·	600	166·6666·

TABLE XVII. *continued.*

LAND MEASURE—(PARALLELOGRAMS).

ing the several lengths and breadths which are equal to an acre of land,
ancing by links.

s.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.
1	166-3893-	651	153-6098	701	142-6533-	751	133-1557-
2	166-1129-	652	153-3742	702	142-4501	752	132-9787
3	165-5837	653	153-1393-	703	142-2475	753	132-8021
4	165-5629	654	152-9051-	704	142-0454-	754	132-6259-
5	165-2892-	655	152-6717-	705	141-8439-	755	132-4503
6	165-0165-	656	152-4390	706	141-6430-	756	132-2751
7	164-7446	657	152-2070	707	141-4427-	757	132-1003-
8	164-4736	658	151-9756-	708	141-2429-	758	131-9761
9	164-2036	659	151-7450-	709	141-0437	759	131-7523
0	163-9344	660	151-5151-	710	140-8450-	760	131-5788-
1	163-6661	661	151-2859	711	140-6469-	761	131-4060
2	163-3986-	662	151-0574	712	140-4494	762	131-2335-
3	163-1321	663	150-8295-	713	140-2524-	763	131-0615-
4	162-8664	664	150-6024	714	140-0560	764	130-8900-
5	162-6162-	665	150-3759	715	139-8601	765	130-7189-
6	162-3376-	666	150-1501-	716	139-6648	766	130-5483-
7	162-0745-	667	149-9250	717	139-4700	767	130-3780-
8	161-8122-	668	149-7005-	718	139-2757-	768	130-2083-
9	161-5508-	669	149-4768	719	139-0820-	769	130-0390
0	161-2903-	670	149-2537	720	138-8888-	770	129-8714
1	161-0305-	671	149-0312-	721	138-6962-	771	129-7016-
2	160-7717	672	148-8095	722	138-5041	772	129-5336-
3	160-5136	673	148-5884	723	138-3125-	773	129-3661
4	160-2564	674	148-3679-	724	138-1215	774	129-1989-
5	160-	675	148-1481	725	137-9303	775	129-0322-
6	159-7444	676	147-9289-	726	137-7410	776	128-8646-
7	159-4896	677	147-7104-	727	137-5515-	777	128-7001
8	159-2356-	678	147-4926	728	137-3626	778	128-5347
9	158-9825	679	147-2754	729	137-1742	779	128-3697
0	158-7301-	680	147-0588	730	136-9863	780	128-2050
1	158-4786	681	146-8428	731	136-7989	781	128-0409-
2	158-2278	682	146-6275-	732	136-6120	782	127-8772
3	157-9778	683	146-4128-	733	136-4256-	783	127-7139
4	157-7287	684	146-1988	734	136-2397-	784	127-5510
5	157-4803	685	145-9854	735	136-0544	785	127-3885-
6	157-2327	686	145-7725-	736	135-8695	786	127-2264-
7	156-9858-	687	145-5604	737	135-6852	787	127-0648
8	156-7398	688	145-3494-	738	135-5013-	788	126-9035-
9	156-4945	689	145-1378-	739	135-3179-	789	126-7427
0	156-25	690	144-9275	740	135-1351	790	126-5822-
1	156-0062	691	144-7178	741	134-9527-	791	126-4222-
2	155-7632	692	144-4508-	742	134-7738-	792	126-2626-
3	155-5209-	693	144-3001	743	134-5894	793	126-1034
4	155-2795	694	144-0922	744	134-4086	794	125-9445-
5	155-0387-	695	143-8848-	745	134-2281-	795	125-7861-
6	154-7987-	696	143-6781-	746	134-0487-	796	125-6281-
7	154-5595	697	143-4720	747	133-8688	797	125-4705
8	154-3222	698	143-2664-	748	133-6898	798	125-3132-
9	154-0832	699	143-0615	749	133-5101	799	125-1584
0	153-8461-	700	142-8571	750	133-3333	800	125-

TABLE XVII. *continued.*

LAND MEASURE—(PARALLELOGRAMS).

Showing the several lengths and breadths which are equal to an acre advancing by links.

Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Links. Pts.	Lks.	Li
801	124·8439	851	117·5088	901	110·9877·	951	10
802	124·6882·	852	117·3708·	902	110·8647·	952	10
803	124·5330	853	117·2332·	903	110·7419·	953	10
804	124·3781	854	117·0960	904	110·6199·	954	10
805	124·2236	855	116·9590·	905	110·4973·	955	10
806	124·0694·	856	116·8224	906	110·3752·	956	10
807	123·9157	857	116·6861	907	110·2535·	957	10
808	123·7623·	858	116·5501	908	110·1321·	958	10
809	123·6093·	859	116·4144	909	110·0110	959	10
810	123·4567·	860	116·2795·	910	109·8900	960	10
811	123·3045·	861	116·1440	911	109·7694·	961	10
812	123·1527	862	116·0928	912	109·6491	962	10
813	123·0012	863	115·8748·	913	109·5290	963	10
814	122·8501	864	115·7407	914	109·4042·	964	10
815	122·6993·	865	115·6079	915	109·2896	965	10
816	122·5490	866	115·4734	916	109·1703	966	10
817	122·3990	867	115·3402·	917	109·0512·	967	10
818	122·2493·	868	115·2073	918	108·9320	968	10
819	122·1001	869	115·0747	919	108·8139	969	10
820	121·9512	870	114·9425	920	108·6956·	970	10
821	121·8026·	871	114·8105·	921	108·5776	971	10
822	121·6545	872	114·6788·	922	108·4598·	972	10
823	121·5066·	873	114·5475	923	108·3423·	973	10
824	121·3592	874	114·4162·	924	108·2251	974	10
825	121·2121	875	114·2857	925	108·1081	975	10
826	121·0603	876	114·1502·	926	107·9913·	976	10
827	120·9189·	877	114·0250·	927	107·8748·	977	10
828	120·7728	878	113·8952	928	107·7586	978	10
829	120·6272·	879	113·7656	929	107·6426	979	10
830	120·4819	880	113·6363·	930	107·5269	980	10
831	120·3369	881	113·5073·	931	107·4113·	981	10
832	120·1923	882	113·3787·	932	107·2961	982	10
833	120·0480	883	113·2502·	933	107·1811	983	10
834	119·9040·	884	113·1221·	934	107·0664	984	10
835	119·7604·	885	112·9943·	935	106·9518·	985	10
836	119·6172	886	112·8668	936	106·8376	986	10
837	119·4743	887	112·7395·	937	106·7235·	987	10
838	119·3317·	888	112·6126	938	106·6098	988	10
839	119·1895	889	112·4859	939	106·4962·	989	10
840	119·0476	890	112·3595·	940	106·3829·	990	10
841	118·9060·	891	112·2334	941	106·2699	991	10
842	118·7648	892	112·1076	942	106·1571	992	10
843	118·6239·	893	111·9820·	943	106·0445	993	10
844	118·4831·	894	111·8563	944	105·9322	994	10
845	118·3431·	895	111·7318	945	105·8201·	995	10
846	118·2033	896	111·6071	946	105·7082·	996	10
847	118·0637·	897	111·4827	947	105·5969	997	10
848	117·9245	898	111·3585·	948	105·4852	998	10
849	117·7856	899	111·2347	949	105·3714	999	10
850	117·6470·	900	111·1111	950	105·2631·	1000	10

TABLE XVIII.

Showing the number of links in the side of a square of any number of acres of land, advancing by quarters at a time to 28 acres, and thence by half-acres to 100.

Acres.	Links. Pts.	Acres.	Links. Pts.	Acres.	Links. Pts.	Acres.	Links. Pts.
$\frac{1}{4}$	158·1139	$12\frac{1}{4}$	1106·7950	$24\frac{1}{4}$	1557·240	$44\frac{1}{2}$	2109·50
$\frac{1}{2}$	223·6068	$12\frac{1}{2}$	1118·0339	$24\frac{1}{2}$	1565·246	45	2121·32
$\frac{3}{4}$	273·8613	$12\frac{3}{4}$	1129·1550	$24\frac{3}{4}$	1573·210	$\frac{1}{2}$	2133·07
1	316·2278	13	1140·7154	25	1581·137	46	2144·76
$\frac{1}{4}$	353·5534	$13\frac{1}{4}$	1151·085	$25\frac{1}{4}$	1589·024	$\frac{1}{2}$	2156·38
$\frac{1}{2}$	387·2983	$13\frac{1}{2}$	1161·895	$25\frac{1}{2}$	1596·871	47	2167·94
$\frac{3}{4}$	414·1650	$13\frac{3}{4}$	1172·650	$25\frac{3}{4}$	1604·682	$\frac{1}{2}$	2179·44
2	447·2136	14	1183·215	26	1612·451	48	2190·89
$\frac{1}{4}$	474·3417	$14\frac{1}{4}$	1193·730	$26\frac{1}{4}$	1620·185	$\frac{1}{2}$	2202·27
$\frac{1}{2}$	500·	$14\frac{1}{2}$	1204·155	$26\frac{1}{2}$	1627·832	49	2213·59
$\frac{3}{4}$	524·4044	$14\frac{3}{4}$	1214·495	$26\frac{3}{4}$	1635·543	$\frac{1}{2}$	2224·85
3	547·7226	15	1224·744	27	1643·167	50	2236·06
$\frac{1}{4}$	570·8770	$15\frac{1}{4}$	1234·905	$27\frac{1}{4}$	1650·744	$\frac{1}{2}$	2247·22
$\frac{1}{2}$	591·6079	$15\frac{1}{2}$	1244·985	$27\frac{1}{2}$	1658·312	51	2258·31
$\frac{3}{4}$	612·3720	$15\frac{3}{4}$	1254·990	$27\frac{3}{4}$	1665·833	$\frac{1}{2}$	2260·36
4	632·4555	16	1264·911	28	1673·230	52	2280·35
$\frac{1}{4}$	651·9200	$16\frac{1}{4}$	1274·750	$\frac{1}{2}$	1688·19	$\frac{1}{2}$	2291·28
$\frac{1}{2}$	670·8204	$16\frac{1}{2}$	1284·523	29	1702·93	53	2302·17
$\frac{3}{4}$	689·2020	$16\frac{3}{4}$	1294·215	$\frac{1}{2}$	1717·55	$\frac{1}{2}$	2313·00
5	707·1068	17	1303·840	30	1732·05	54	2323·79
$\frac{1}{4}$	724·5685	$17\frac{1}{4}$	1313·390	$\frac{1}{2}$	1746·42	$\frac{1}{2}$	2334·62
$\frac{1}{2}$	741·6195	$17\frac{1}{2}$	1322·875	31	1760·68	55	2345·20
$\frac{3}{4}$	758·2875	$17\frac{3}{4}$	1332·290	$\frac{1}{2}$	1774·82	$\frac{1}{2}$	2355·84
6	774·5967	18	1341·640	32	1788·85	56	2366·43
$\frac{1}{4}$	790·5690	$18\frac{1}{4}$	1350·925	$\frac{1}{2}$	1802·77	$\frac{1}{2}$	2376·97
$\frac{1}{2}$	806·2258	$18\frac{1}{2}$	1360·147	33	1816·59	57	2387·46
$\frac{3}{4}$	821·5835	$18\frac{3}{4}$	1369·305	$\frac{1}{2}$	1830·30	$\frac{1}{2}$	2397·91
7	836·6600	19	1378·404	34	1843·90	58	2408·31
$\frac{1}{4}$	851·4650	$19\frac{1}{4}$	1387·440	$\frac{1}{2}$	1857·41	$\frac{1}{2}$	2418·67
$\frac{1}{2}$	866·0254	$19\frac{1}{2}$	1396·424	35	1870·82	59	2428·99
$\frac{3}{4}$	867·4650	$19\frac{3}{4}$	1405·345	$\frac{1}{2}$	1884·14	$\frac{1}{2}$	2439·26
8	894·4271	20	1414·213	36	1897·37	60	2449·48
$\frac{1}{4}$	908·2950	$20\frac{1}{4}$	1423·020	$\frac{1}{2}$	1910·50	$\frac{1}{2}$	2459·67
$\frac{1}{2}$	921·9544	$20\frac{1}{2}$	1431·782	37	1923·54	61	2469·81
$\frac{3}{4}$	935·4100	$20\frac{3}{4}$	1440·485	$\frac{1}{2}$	1936·49	$\frac{1}{2}$	2479·91
9	948·6833	21	1449·137	38	1949·36	62	2489·97
$\frac{1}{4}$	961·7690	$21\frac{1}{4}$	1457·735	$\frac{1}{2}$	1962·14	$\frac{1}{2}$	2500·
$\frac{1}{2}$	974·6794	$21\frac{1}{2}$	1466·287	39	1974·84	63	2509·98
$\frac{3}{4}$	987·4205	$21\frac{3}{4}$	1474·785	$\frac{1}{2}$	1987·46	$\frac{1}{2}$	2519·92
10	1000·	22	1483·237	40	2000·00	64	2529·82
$\frac{1}{4}$	1012·4225	$22\frac{1}{4}$	1491·640	$\frac{1}{2}$	2012·46	$\frac{1}{2}$	2539·68
$\frac{1}{2}$	1024·6950	$22\frac{1}{2}$	1500·	41	2024·84	65	2549·50
$\frac{3}{4}$	1036·8220	$22\frac{3}{4}$	1508·310	$\frac{1}{2}$	2037·15	$\frac{1}{2}$	2559·29
11	1048·8088	23	1516·575	42	2049·39	66	2569·04
$\frac{1}{4}$	1060·6600	$23\frac{1}{4}$	1524·795	$\frac{1}{2}$	2061·55	$\frac{1}{2}$	2578·75
$\frac{1}{2}$	1072·3805	$23\frac{1}{2}$	1532·970	43	2073·64	67	2588·43
$\frac{3}{4}$	1083·9700	$23\frac{3}{4}$	1541·100	$\frac{1}{2}$	2085·66	$\frac{1}{2}$	2598·07
12	1095·4451	24	1549·196	44	2097·61	68	2607·68

TABLE XVIII. *continued.*

Acres.	Links. Pts.	Acres.	Links. Pts.	Acres.	Links. Pts.	Acres.	Links. Pts.
68½	2617·25	76½	2765·96	84½	2906·88	92½	3041·38
69½	2626·78	77½	2774·88	85½	2915·47	93½	3049·59
70½	2636·28	78½	2783·88	86½	2924·03	94½	3057·77
71½	2645·75	79½	2792·84	87½	2932·57	95½	3065·94
72½	2655·18	80½	2801·78	88½	2941·08	96½	3074·08
73½	2664·58	81½	2810·69	89½	2949·57	97½	3082·20
74½	2673·94	82½	2819·57	90½	2958·03	98½	3090·30
75½	2683·28	83½	2828·42	91½	2966·47	99½	3098·38
76½	2692·58	84½	2837·25	92½	2974·89	100	3106·44
	2701·85		2846·06		2983·28		3114·48
	2711·08		2854·82		2991·65		3122·49
	2720·29		2863·56		3000·		3130·49
	2729·46		2872·28		3008·32		3138·47
	2738·61		2880·97		3016·02		3146·42
	2747·72		2889·63		3024·89		3154·36
	2756·80		2898·27		3033·15		3162·27

TABLE XIX.

Shows the weight in lbs. of Coppers containing 1 to 220 gallons; the dimensions taken from lag to brim, that is, the diagonal from top of rim to the bottom edge.

Inches lag to brim.	Gallons.	Weight in lbs.	Inches lag to brim.	Gallons.	Weight in lbs.	Inches lag to brim.	Gallons.	Weight in lbs.
9½	1	1½	26½	21	31½	41	78	117
12½	2	3	27	22	33	42	86	129
14	3	4½	27½	23	34½	43	89	133
15½	4	6	27¾	24	36	44	93	139
16½	5	7½	27¾	25	37½	45	100	150
17½	6	9	28	26	39	46	109	164
18½	7	10½	28½	27	40½	47	118	177
19½	8	12	29	28	42	48	126	189
20½	9	13½	29½	29	43½	49	135	202
21	10	15	30	30	45	50	144	216
21½	11	16½	31	33	50	51	154	224
22	12	18	32	36	54	52	168	234
22½	13	19½	33	41	59½	53	175	244
23½	14	21	34	43	64½	54	185	254
24	15	22½	35	48	72	55	188	264
24½	16	24	36	53	79½	56	190	274
25	17	25½	37	58	87	57	195	285
25½	18	27	38	63	94½	58	200	295
26	19	28½	39	67	100	59	210	308
26½	20	30	40	71	106½	60	220	320

TO CALCULATE BY FEET.

Multiply the number of links which are opposite any given number of res by 7·92 and divide by twelve; the product will be given in feet.

TO CALCULATE BY YARDS.

Multiply by 7·92 and divide by 36; the product will be given in yards.

TO CALCULATE BY RODS.

Multiply by 7·92 and divide by 198; the product will be given in rods.

TO CALCULATE BY FRENCH METRE.

Multiply by 7·92 and divide by 39·37079; the product will be given in rench metres.

TABLE XX.

CALVING TABLE.

Day Bulled	Will Calve	Day Bulled	Will Calve	Day Bulled	Will Calve	Day Bulled	Will Calve
Jan. 1	Oct. 8	April 1	Jan. 6	July 1	April 7	Oct. 1	July 9
" 7	" 14	" 7	" 12	" 7	" 13	" 7	" 15
" 14	" 21	" 14	" 19	" 14	" 20	" 14	" 22
" 21	" 28	" 21	" 26	" 21	" 28	" 21	" 29
" 28	Nov. 4	" 28	Feb. 2	" 28	May 4	" 28	Aug. 5
" 31	" 7	" 30	" 4	" 31	" 8	" 31	" 8
Feb. 1	" 8	May 1	" 5	Aug. 1	" 9	Nov. 1	" 9
" 7	" 14	" 7	" 11	" 7	" 15	" 7	" 15
" 14	" 21	" 14	" 18	" 14	" 22	" 14	" 21
" 21	" 28	" 21	" 25	" 21	" 29	" 21	" 29
" 28	Dec. 5	" 28	March 4	" 28	June 5	" 28	Sept. 5
March 1	" 6	" 31	" 7	" 31	" 8	" 30	" 7
" 7	" 12	June 1	" 8	Sept. 1	" 9	Dec. 1	" 8
" 14	" 19	" 7	" 14	" 7	" 15	" 7	" 14
" 21	" 26	" 14	" 21	" 14	" 22	" 14	" 21
" 28	Jan. 2	" 21	" 28	" 21	" 29	" 21	" 28
" 31	" 5	" 28	April 4	" 28	July 6	" 28	Oct. 5
		" 30	" 6	" 30	" 8	" 31	" 8

TABLE XXI.

LAMBING TABLE.

From	Will Lamb.	From	Will Lamb.	From	Will Lamb.	From	Will Lamb.
Jan. 1	May 27	April 1	Aug. 26	July 1	Nov. 25	Oct. 1	Feb. 25
" 14	June 10	" 14	Sept. 8	" 14	Dec. 9	" 14	Mar. 10
Feb. 1	" 28	May 1	" 22	Aug. 1	" 26	Nov. 1	" 26
" 14	July 12	" 14	Oct. 8	" 14	Jan. 8	" 14	April 9
March 1	" 26	June 1	" 25	Sept. 1	" 26	Dec. 1	" 25
" 14	Aug. 8	" 14	Nov. 8	" 14	Feb. 9	" 14	May 9

TABLE XXII

Showing the number of Plants required to plant an acre of land at several required distances.

Row to row.		Plant to plant.		Number of plants.	Row to row.		Plant to plant.		Number of plants.
ft.	in.	ft.	in.		ft.	in.	ft.	in.	
	6	×	4	261360	3	0	×	3	0
	6		5	209088	3	3		2	9
	6		6	174240	3	3		3	0
	7		5	179218	3	3		3	3
	7		6	149349	3	6		3	0
	7		7	128013	3	6		3	3
	8		6	130680	3	6		3	6
	8		7	112011	3	9		3	3
	8		8	98010	3	9		3	6
	9		7	99565	3	9		3	9
	9		8	87120	4	0		3	0
	9		9	77440	4	0		3	6
	10		8	78408	4	0		4	0
	10		9	67474	4	3		3	3
	10		10	62726	4	3		3	9
	11		9	67474	4	3		4	3
	11		10	62726	4	6		3	6
	11		11	51840	4	6		4	0
1	0		10	52272	4	6		4	6
1	0		11	47520	4	9		3	9
1	0	1	0	43660	4	9		4	3
1	2		10	44804	4	9		4	9
1	2	1	0	37337	5	0		4	0
1	2	1	2	32003	5	0		4	6
1	4	1	0	32670	5	0		5	0
1	4	1	2	28003	5	3		4	3
1	4	1	4	24503	5	3		4	9
1	6	1	2	24891	5	3		5	3
1	6	1	4	21780	5	6		4	6
1	6	1	6	19360	5	6		5	0
1	8	1	4	19608	5	6		5	6
1	8	1	6	16869	5	9		4	9
1	8	1	8	15682	5	9		5	3
1	10	1	6	15840	5	9		5	9
1	10	1	8	14256	6	0		5	0
1	10	1	10	12960	6	0		5	6
2	0	1	8	13068	6	0		6	0
2	0	1	10	11880	6	3		5	3
2	0	2	0	10890	6	3		5	9
2	3	1	9	11063	6	3		6	3
2	3	2	0	9680	6	6		5	6
2	3	2	3	8602	6	6		6	0
2	6	2	0	8712	6	6		6	6
2	6	2	3	7744	6	9		5	6
2	6	2	6	6969	6	9		6	3
2	9	2	3	7044	6	9		6	9
2	9	2	6	6336	7	0		5	6
2	9	2	9	5760	7	0		6	3
3	0	2	6	5808	7	0		7	0
3	0	2	9	5280	7	3		5	9

TABLE XXII. *continued.*

wing the number of Plants required to plant an acre of land at the several required distances.

Row to row.		Plant to plant.	Number of plants.	Row to row.		Plant to plant.	Number of plants.				
ft.	in.	ft.	in.	ft.	in.	ft.	in.				
7	3	×	6	6	924	13	0	×	13	0	258
7	3		7	3	828	13	6		11	0	293
7	6		6	0	968	13	6		12	3	263
7	6		6	9	860	13	6		13	6	239
7	6		7	6	774	14	0		11	0	283
7	9		6	3	899	14	0		12	6	249
7	9		7	0	801	14	0		14	0	222
7	9		7	9	725	14	6		11	6	262
8	0		6	6	838	14	6		13	0	231
8	0		7	3	751	14	6		14	6	207
8	0		8	0	681	15	0		12	0	242
8	3		6	9	781	15	0		13	6	215
8	3		7	6	704	15	0		15	0	194
8	3		8	3	640	15	6		12	6	225
8	6		7	0	732	15	6		13	9	204
8	6		7	9	661	15	6		15	6	181
8	6		8	6	605	16	0		13	0	209
8	9		7	3	687	16	0		14	6	188
8	9		8	0	622	16	0		16	0	170
8	9		8	9	569	16	6		13	6	195
9	0		7	6	645	16	6		15	0	176
9	0		8	3	587	16	6		16	6	160
9	0		9	0	538	17	0		14	0	183
9	3		7	9	609	17	0		15	6	165
9	3		8	6	554	17	0		17	0	151
9	3		9	3	509	17	6		14	6	172
9	6		8	0	573	17	6		16	0	155
9	6		8	9	524	17	6		17	6	142
9	6		9	6	483	18	0		15	0	161
10	0		8	0	545	18	0		16	6	147
10	0		9	0	484	18	0		18	0	134
10	0		10	0	435	18	6		15	6	151
10	6		8	6	488	18	6		17	0	138
10	6		9	6	437	18	6		18	6	127
10	6		10	6	395	19	0		16	0	143
11	0		9	0	440	19	0		17	6	131
11	0		10	0	396	19	0		19	0	121
11	0		11	0	360	19	6		16	6	135
11	6		9	6	399	19	6		18	0	124
11	6		10	6	361	19	6		19	6	115
11	6		11	6	329	20	0		17	0	128
12	0		10	0	363	20	0		18	6	118
12	0		11	0	330	20	0		20	0	109
12	0		12	0	303	20	6		17	6	121
12	6		10	6	332	20	6		19	0	111
12	6		11	6	303	20	6		20	6	104
12	6		12	6	279	21	0		18	0	115
13	0		10	6	319	21	0		19	6	106
13	0		11	9	285	21	0		21	0	99

LINEAL OR LAND MEASURE.

Inches.

7·92 =	1 Link.								
12 =	1·515 =	1 Foot.							
18 =	2·273 =	1½ =	1 Cubit.						
36 =	4·545 =	3 =	2 =	1 Yard.					
198 =	25 =	16½ =	11 =	5½ =	1 Rod.				
792 =	100 =	66 =	44 =	22 =	4 =	1 Chain.			
7920 =	1000 =	660 =	440 =	220 =	40 =	10 =	1 Furlong.		
63360 =	8000 =	5280 =	3520 =	1760 =	320 =	80 =	8 =	1 Mile.	

SQUARE MEASURE.

Square Links.

2.29568=	1 Square Foot.				
20.66116=	9 =	1 Square Yard.			
625 =	272½=	30½=	1 Square Rod.		
10000 =	4356 =	484 =	16=	1 Square Chain.	
25000 =	10890 =	1210 =	40=	2½=	1 Square Rood
100000 =	43560 =	4840 =	160=	10 =	4= 1 Sq. Acre
34000000	=27878400	=3097600	=102400	=6400	=2560=640=1 Sq.
					Mile

62.7264 Square Inches are equal to a Square Link.

CUBIC MEASURE.

Cubic Inches.

496·793=	1 Cubic Link.
1728 =	3·47831= 1 Cubic Foot.
46656 =	93·91425= 27 =1 Cubic Yard.
7762392 =	15625 =449·2125=166·375=1 Cubic Rod.

FRENCH MEASURES.

A Linear Metre = 39·37079 Inches.
A Square Metre = 1550· „
A Cubic Metre = 61027· „

Weale's Rudimentary Series.



PHILADELPHIA, 1876.
THE PRIZE MEDAL

Was awarded to the Publishers for
Books: Rudimentary, Scientific,
"WEALE'S SERIES," ETC.



A NEW LIST OF WEALE'S SERIES

RUDIMENTARY SCIENTIFIC, EDUCATIONAL,
AND CLASSICAL.

Comprising nearly Three Hundred and Fifty distinct works in almost every department of Science, Art, and Education, recommended to the notice of Engineers, Architects, Builders, Artisans, and Students generally, as well as to those interested in Workmen's Libraries, Literary and Scientific Institutions, Colleges, Schools, Science Classes, &c., &c.

"WEALE'S SERIES includes Text-Books on almost every branch of Science and Industry, comprising such subjects as Agriculture, Architecture and Building, Civil Engineering, Fine Arts, Mechanics and Mechanical Engineering, Physical and Chemical Science, and many miscellaneous Treatises. The whole are constantly undergoing revision, and new editions, brought up to the latest discoveries in scientific research, are constantly issued. The prices at which they are sold are as low as their excellence is assured."—*American Literary Gazette*.

"Amongst the literature of technical education, WEALE'S SERIES has ever enjoyed a high reputation, and the additions being made by Messrs. CROSBY LOCKWOOD & Co. render the series even more complete, and bring the information upon the several subjects down to the present time."—*Mining Journal*.

"It is impossible to do otherwise than bear testimony to the value of WEALE'S SERIES."—*Engineer*.

"Everybody—even that outrageous nuisance 'Every Schoolboy'—knows the merits of 'WEALE'S RUDIMENTARY SERIES.' Any persons wishing to acquire knowledge cannot do better than look through Weale's Series and get all the books they require. The Series is indeed an inexhaustible mine of literary wealth."—*The Metropolitan*.

"WEALE'S SERIES has become a standard as well as an unrivalled collection of treatises in all branches of art and science."—*Public Opinion*.



LONDON, 1862.
THE PRIZE MEDAL

Was awarded to the Publishers of
"WEALE'S SERIES."



CROSBY LOCKWOOD & CO.,

7, STATIONERS' HALL COURT, LUDGATE HILL, LONDON, E.C.

WEALE'S RUDIMENTARY SCIENTIFIC SERIES.



* * The volumes of this Series are freely Illustrated with Woodcuts, or otherwise, where requisite. Throughout the following List it must be understood that the books are bound in limp cloth, unless otherwise stated; *but the volumes marked with a ‡ may also be had strongly bound in cloth boards for 6d. extra.*

N.B.—In ordering from this List it is recommended, as a means of facilitating business and obviating error, to quote the numbers affixed to the volumes, as well as the titles and prices.


- No. ARCHITECTURE, BUILDING, ETC.**
16. **ARCHITECTURE—ORDERS**—The Orders and their Æsthetic Principles. By W. H. LEEDS. Illustrated. 1s. 6d.
17. **ARCHITECTURE—STYLES**—The History and Description of the Styles of Architecture of Various Countries, from the Earliest to the Present Period. By T. TALBOT BURY, F.R.I.B.A., &c. Illustrated. 2s.
- * * ORDERS AND STYLES OF ARCHITECTURE, in *One Vol.*, 3s. 6d.
18. **ARCHITECTURE—DESIGN**—The Principles of Design in Architecture, as deducible from Nature and exemplified in the Works of the Greek and Gothic Architects. By E. L. GARBETT, Architect. Illustrated. 2s. 6d.
- * * *The three preceding Works, in One handsome Vol., half bound, entitled "MODERN ARCHITECTURE," price 6s.*
22. **THE ART OF BUILDING**, Rudiments of. General Principles of Construction, Materials used in Building, Strength and Use of Materials, Working Drawings, Specifications, and Estimates. By E. DOBSON, 2s. ‡
23. **BRICKS AND TILES**, Rudimentary Treatise on the Manufacture of; containing an Outline of the Principles of Brickmaking. By EDW. DOBSON, M.R.I.B.A. With Additions by C. TOMLINSON, F.R.S. Illustrated, 3s. ‡
25. **MASONRY AND STONECUTTING**, Rudimentary Treatise on; in which the Principles of Masonic Projection and their application to the Construction of Curved Wing-Walls, Domes, Oblique Bridges, and Roman and Gothic Vaulting, are concisely explained. By EDWARD DOBSON, M.R.I.B.A., &c. Illustrated with Plates and Diagrams. 2s. 6d. ‡
44. **FOUNDATIONS AND CONCRETE WORKS**, a Rudimentary Treatise on; containing a Synopsis of the principal cases of Foundation Works, with the usual Modes of Treatment, and Practical Remarks on Footings, Planking, Sand, Concrete, Béton, Pile-driving, Caissons, and Cofferdams. By E. DOBSON, M.R.I.B.A., &c. Fourth Edition, revised by GEORGE DODD, C.E. Illustrated. 1s. 6d.
42. **COTTAGE BUILDING**. By C. BRUCE ALLEN, Architect. Ninth Edition, revised and enlarged. Numerous Illustrations. 1s. 6d.
45. **LIMES, CEMENTS, MORTARS, CONCRETES, MASTICS, PLASTERING**, &c. By G. R. BURNELL, C.E. Eleventh Edition. 1s. 6d.
57. **WARMING AND VENTILATION**, a Rudimentary Treatise on; being a concise Exposition of the General Principles of the Art of Warming and Ventilating Domestic and Public Buildings, Mines, Lighthouses, Ships, &c. By CHARLES TOMLINSON, F.R.S., &c. Illustrated. 3s.
- 83* *. **CONSTRUCTION OF DOOR LOCKS**. Compiled from the Papers of A. C. HOBBS, Esq., of New York, and Edited by CHARLES TOMLINSON, F.R.S. To which is added, a Description of Fenby's Patent Locks, and a Note upon IRON SAFES by ROBERT MALLETT, M.I.C.E. Illus. 2s. 6d.
111. **ARCHES, PIERS, BUTTRESSES, &c.**: Experimental Essays on the Principles of Construction in; made with a view to their being useful to the Practical Builder. By WILLIAM BLAND. Illustrated. 1s. 6d.

 *The ‡ indicates that these vols. may be had strongly bound at 6d. extra.*

LONDON: CROSBY LOCKWOOD AND CO.,

Architecture, Building, etc., continued.

116. **THE ACOUSTICS OF PUBLIC BUILDINGS;** or, The Principles of the Science of Sound applied to the purposes of the Architect and Builder. By T. ROGER SMITH, M.R.I.B.A., Architect. Illustrated. 1s. 6d.
124. **CONSTRUCTION OF ROOFS,** Treatise on the, as regards Carpentry and Joinery. Deduced from the Works of ROBISON, PRICE, and TREDGOLD. Illustrated. 1s. 6d.
127. **ARCHITECTURAL MODELLING IN PAPER,** the Art of. By T. A. RICHARDSON, Architect. Illustrated. 1s. 6d.
128. **VITRUVIUS—THE ARCHITECTURE OF MARCUS VITRUVIUS POLLO.** In Ten Books. Translated from the Latin by JOSEPH GWILT, F.S.A., F.R.A.S. With 23 Plates. 5s.
130. **GRECIAN ARCHITECTURE,** An Inquiry into the Principles of Beauty in; with an Historical View of the Rise and Progress of the Art in Greece. By the EARL OF ABERDEEN. 1s.
- *. The two preceding Works in One handsome Vol., half bound, entitled "ANCIENT ARCHITECTURE," price 6s.
- 16, 17, 18, 128, and 130, in One Vol., entitled "ANCIENT AND MODERN ARCHITECTURE," half bound, 12s.
132. **DWELLING-HOUSES,** a Rudimentary Treatise on the Erection of. Illustrated by a Perspective View, Plans, Elevations, and Sections of a pair of Semi-detached Villas, with the Specification, Quantities, and Estimates, and every requisite detail, in sequence, for their Construction and Finishing. By S. H. BROOKS, Architect. New Edition, with Plates. 2s. 6d.‡
156. **QUANTITIES AND MEASUREMENTS,** How to Calculate and Take them in Bricklayers', Masons', Plasterers', Plumbers', Painters', Paper-hangers', Gilders', Smiths', Carpenters', and Joiners' Work. By A. C. BEATON, Architect and Surveyor. New and Enlarged Edition. Illus. 1s. 6d.
175. **LOCKWOOD & CO.'S BUILDER'S AND CONTRACTOR'S PRICE BOOK,** for 1881, containing the latest Prices of all kinds of Builders' Materials and Labour, and of all Trades connected with Building: Lists of the Members of the Metropolitan Board of Works, of Districts, District Officers, and District Surveyors, and the Metropolitan Bye-laws. Edited by FRANCIS T. W. MILLER, Architect and Surveyor. 3s. 6d.; half bound, 4s.
182. **CARPENTRY AND JOINERY—THE ELEMENTARY PRINCIPLES OF CARPENTRY.** Chiefly composed from the Standard Work of THOMAS TREDGOLD, C.E. With Additions from the Works of the most Recent Authorities, and a TREATISE ON JOINERY by E. WYNDHAM TARN, M.A. Numerous Illustrations. 3s. 6d.‡
- 182*. **CARPENTRY AND JOINERY. ATLAS** of 35 Plates to accompany the foregoing book. With Descriptive Letterpress. 4to. 6s.; cloth boards, 7s. 6d.
187. **HINTS TO YOUNG ARCHITECTS.** By GEORGE WIGHTWICK. New, Revised, and enlarged Edition. By G. HUSKISSON GUILLAUME, Architect. With numerous Woodcuts. 3s. 6d.‡
188. **HOUSE PAINTING, GRAINING, MARBLING, AND SIGN WRITING:** A Practical Manual of, containing full information on the Processes of House-Painting, the Formation of Letters and Practice of Sign-Writing, the Principles of Decorative Art, a Course of Elementary Drawing for House-Painters, Writers, &c., &c. With 9 Coloured Plates of Woods and Marbles, and nearly 150 Wood Engravings. By ELLIS A. DAVIDSON. Third Edition, carefully revised. 5s. cloth limp; 6s. cloth boards.
189. **THE RUDIMENTS OF PRACTICAL BRICKLAYING.** In Six Sections: General Principles; Arch Drawing, Cutting, and Setting; Pointing; Paving, Tiling, Materials; Slating and Plastering; Practical Geometry, Mensuration, &c. By ADAM HAMMOND. Illustrated. 1s. 6d.
191. **PLUMBING.** A Text-Book to the Practice of the Art or Craft of the Plumber. With Chapters upon House Drainage, embodying the latest Improvements. Second Edition, enlarged. Containing 300 Illustrations. By W. P. BUCHAN, Sanitary Engineer. 3s. 6d.‡


 The ‡ indicates that these vols. may be had strongly bound at 6d. extra.

Architecture, Building, etc., continued.

192. *THE TIMBER IMPORTER'S, TIMBER MERCHANTS, and BUILDER'S STANDARD GUIDE*; comprising copious and valuable Memoranda for the Retailer and Builder. By RICHARD E. GRANDY. Second Edition, Revised. 3s.†
205. *THE ART OF LETTER PAINTING MADE EASY*. By J. G. BADENOCH. Illustrated with 12 full-page Engravings of Examples. 1s.
206. *A BOOK ON BUILDING, Civil and Ecclesiastical*, including CHURCH RESTORATION. With the Theory of Domes and the Great Pyramid, &c. By Sir EDMUND BECKETT, Bart., LL.D., Q.C., F.R.A.S. Second Edition, enlarged, 4s. 6d.†

CIVIL ENGINEERING, ETC.


219. *CIVIL ENGINEERING*. By HENRY LAW, M.Inst. C.E. Including a Treatise on HYDRAULIC ENGINEERING by GEO. R. BURNELL, M.Inst.C.E. Sixth Edition, revised, WITH LARGE ADDITIONS ON RECENT PRACTICE IN CIVIL ENGINEERING, by D. KINNEAR CLARK, M.Inst. C.E., Author of "Tramways: Their Construction," &c. 6s. 6d., Cloth boards, 7s. 6d.
29. *THE DRAINAGE OF DISTRICTS AND LANDS*. By G. DRYSDALE DEMPSEY, C.E. [New Edition in preparation.]
30. *THE DRAINAGE OF TOWNS AND BUILDINGS*. By G. DRYSDALE DEMPSEY, C.E. [New Edition in preparation.]
31. *WELL-DIGGING, BORING, AND PUMP-WORK*. By JOHN GEORGE SWINDELL, A.R.I.B.A. New Edition, by G. R. BURNELL, C.E. 1s. 6d.
35. *THE BLASTING AND QUARRYING OF STONE*, for Building and other Purposes. With Remarks on the Blowing up of Bridges. By Gen. Sir JOHN BURGOYNE, Bart., K.C.B. Illustrated. 1s. 6d.
62. *RAILWAY CONSTRUCTION*, Elementary and Practical Instructions on the Science of. By Sir M. STEPHENSON, C.E. New Edition, by EDWARD NUGENT, C.E. With Statistics of the Capital, Dividends, and Working of Railways in the United Kingdom. By E. D. CHATTAWAY. 4s.
- 80*. *EMBANKING LANDS FROM THE SEA*, the Practice of. Treated as a Means of Profitable Employment for Capital. With Examples and Particulars of actual Embankments, &c. By J. WIGGINS, F.G.S. 2s.
81. *WATER WORKS*, for the Supply of Cities and Towns. With a Description of the Principal Geological Formations of England as influencing Supplies of Water; and Details of Engines and Pumping Machinery for raising Water. By SAMUEL HUGHES, F.G.S., C.E. New Edition. 4s.†
117. *SUBTERRANEAN SURVEYING*, an Elementary and Practical Treatise on. By THOMAS FENWICK. Also the Method of Conducting Subterranean Surveys without the Use of the Magnetic Needle, and other Modern Improvements. By THOMAS BAKER, C.E. Illustrated. 2s. 6d.†
118. *CIVIL ENGINEERING IN NORTH AMERICA*, a Sketch of. By DAVID STEVENSON, F.R.S.E., &c. Plates and Diagrams. 3s.
197. *ROADS AND STREETS (THE CONSTRUCTION OF)*, in two Parts: I. THE ART OF CONSTRUCTING COMMON ROADS, by HENRY LAW, C.E., revised and condensed by D. KINNEAR CLARK, C.E.; II. RECENT PRACTICE, including pavements of Stone, Wood, and Asphalte. Second Edition, revised, by D. K. CLARK, M.I.C.E. 4s. 6d.†
203. *SANITARY WORK IN THE SMALLER TOWNS AND IN VILLAGES*. Comprising:—1. Some of the more Common Forms of Nuisance and their Remedies; 2. Drainage; 3. Water Supply. A useful book for Members of Local Boards and Rural Sanitary Authorities, Health Officers, Engineers, Surveyors, &c. By CHARLES SLAGG, A.I.C.E. 2s. 6d.†
212. *THE CONSTRUCTION OF GAS-WORKS*, and the Manufacture and Distribution of Coal Gas. Originally written by SAMUEL HUGHES, C.E. Sixth Edition, re-written and much Enlarged by WILLIAM RICHARDS, C.E. With 72 Illustrations. 4s. 6d.† [Just published.]
213. *PIONEER ENGINEERING*. A Treatise on the Engineering Operations connected with the Settlement of Waste Lands in New Countries. By EDWARD DOBSON, Assoc. Inst. C.E. 4s. 6d.†

 The † indicates that these vols. may be had strongly bound at 6d. extra.

LONDON: CROSBY LOCKWOOD AND CO.,

MECHANICAL ENGINEERING, ETC.

33. **CRANES**, the Construction of, and other Machinery for Raising Heavy Bodies for the Erection of Buildings, and for Hoisting Goods. By JOSEPH GLYNN, F.R.S., &c. Illustrated. 1s. 6d.
34. **THE STEAM ENGINE**, a Rudimentary Treatise on. By Dr. LARDNER. Illustrated. 1s. 6d.
59. **STEAM BOILERS**: their Construction and Management. By R. ARMSTRONG, C.E. Illustrated. 1s. 6d.
67. **CLOCKS, WATCHES, AND BELLS**, a Rudimentary Treatise on. By Sir EDMUND BECKETT (late EDMUND BECKETT DENISON), LL.D., Q.C. A New, Revised, and considerably Enlarged Edition (the 6th), with very numerous Illustrations. 4s. 6d. cloth limp; 5s. 6d. cloth boards, gilt.
82. **THE POWER OF WATER**, as applied to drive Flour Mills, and to give motion to Turbines and other Hydrostatic Engines. By JOSEPH GLYNN, F.R.S., &c. New Edition, Illustrated. 2s.†
98. **PRACTICAL MECHANISM**, the Elements of; and Machine Tools. By T. BAKER, C.E. With Remarks on Tools and Machinery, by J. NASMYTH, C.E. Plates. 2s. 6d.†
114. **MACHINERY**, Elementary Principles of, in its Construction and Working. By C. D. ABEL, C.E. 1s. 6d.
139. **THE STEAM ENGINE**, a Treatise on the Mathematical Theory of, with Rules and Examples for Practical Men. By T. BAKER, C.E. 1s. 6d.
162. **THE BRASS FOUNDER'S MANUAL**; Instructions for Modelling, Pattern-Making, Moulding, Turning, Filing, Burnishing, Bronzing, &c. With copious Receipts, &c. By WALTER GRAHAM. 2s.†
164. **MODERN WORKSHOP PRACTICE**, as applied to Marine, Land, and Locomotive Engines, Floating Docks, Dredging Machines, Bridges, Cranes, Ship-building, &c., &c. By J. G. WINTON. Illustrated. 3s.†
165. **IRON AND HEAT**, exhibiting the Principles concerned in the Construction of Iron Beams, Pillars, and Bridge Girders, and the Action of Heat in the Smelting Furnace. By J. ARMOUR, C.E. 2s. 6d.†
166. **POWER IN MOTION**: Horse-Power, Toothed-Wheel Gearing, Long and Short Driving Bands, and Angular Forces. By J. ARMOUR, 2s. 6d.†
167. **IRON BRIDGES, GIRDERS, ROOFS, AND OTHER WORKS**. By FRANCIS CAMPIN, C.E. 2s. 6d.†
171. **THE WORKMAN'S MANUAL OF ENGINEERING DRAWING**. By JOHN MAXTON, Engineer. Fourth Edition. Illustrated with 7 Plates and nearly 350 Woodcuts. 3s. 6d.†
190. **STEAM AND THE STEAM ENGINE**, Stationary and Portable. Being an extension of Mr. John Sewell's "Treatise on Steam." By D. K. CLARK, M.I.C.E. Second Edition, revised. 3s. 6d.†
200. **FUEL**, its Combustion and Economy. By C. W. WILLIAMS, A.I.C.E. With extensive additions on Recent Practice in the Combustion and Economy of Fuel—Coal, Coke, Wood, Peat, Petroleum, &c.—by D. K. CLARK, M.I.C.E. 2nd Edition. 3s. 6d.†
202. **LOCOMOTIVE ENGINES**. By G. D. DEMPSEY, C.E.; with large additions treating of the Modern Locomotive, by D. KINNEAR CLARK, M.I.C.E. 3s.†
211. **THE BOILERMAKER'S ASSISTANT** in Drawing, Tempering, and Calculating Boiler and Tank Work. By JOHN COURTNEY, Practical Boiler Maker. Edited by D. K. CLARK, C.E. 100 Illustrations. 2s.
216. **MATERIALS AND CONSTRUCTION**; A Theoretical and Practical Treatise on the Strains, Designing, and Erection of Works of Construction. By FRANCIS CAMPIN, C.E. 3s.† [Just published.]
217. **SEWING MACHINERY**, being a Practical Manual of the Sewing Machine; comprising its History and Details of its Construction, with full Technical Directions for the Adjusting of Sewing Machines. By J. W. UROUHART, C.E. 2s.† [Just published.]
223. **MECHANICAL ENGINEERING**, A Practical Treatise on. Comprising Metallurgy, Moulding, Casting, Forging, Tools, Workshop Machinery, Mechanical Manipulation, Manufacture of the Steam Engine, &c. By FRANCIS CAMPIN, C.E. 2s. 6d.† [Just published.]

 The † indicates that these vols. may be had strongly bound at 6d. extra.

7, STATIONERS' HALL COURT, LUDGATE HILL, E.C.

SHIPBUILDING, NAVIGATION, MARINE ENGINEERING, ETC.

51. *NAVAL ARCHITECTURE*, the Rudiments of; or an Exposition of the Elementary Principles of the Science, and their Practical Application to Naval Construction. Compiled for the Use of Beginners. By JAMES PEAKE, School of Naval Architecture, H.M. Dockyard, Portsmouth. Fourth Edition, corrected, with Plates and Diagrams. 3s. 6d.‡
- 53*. *SHIPS FOR OCEAN AND RIVER SERVICE*, Elementary and Practical Principles of the Construction of. By HAKON A. SOMMERFELDT, Surveyor of the Royal Norwegian Navy. With an Appendix. 1s. 6d.
- 53**. *AN ATLAS OF ENGRAVINGS* to Illustrate the above. Twelve large folding plates. Royal 4to, cloth. 7s. 6d.
54. *MASTING, MAST-MAKING, AND RIGGING OF SHIPS*, Rudimentary Treatise on. Also Tables of Spars, Rigging, Blocks; Chain, Wire, and Hemp Ropes, &c., relative to every class of vessels. With an Appendix of Dimensions of Masts and Yards of the Royal Navy. By ROBERT KIPPING, N.A. Fourteenth Edition. Illustrated. 2s.‡
- 54*. *IRON SHIP-BUILDING*. With Practical Examples and Details for the Use of Ship Owners and Ship Builders. By JOHN GRANTHAM, Consulting Engineer and Naval Architect. 5th Edition, with Additions. 4s.
- 54**. *AN ATLAS OF FORTY PLATES* to Illustrate the above. Fifth Edition. Including the latest Examples, such as H.M. Steam Frigates "Warrior," "Hercules," "Bellerophon;" H.M. Troop Ship "Serapis," Iron Floating Dock, &c., &c. 4to, boards. 38s.
55. *THE SAILOR'S SEA BOOK*: a Rudimentary Treatise on Navigation. Part I. How to Keep the Log and Work it off. Part II. On Finding the Latitude and Longitude. By JAMES GREENWOOD, B.A. To which are added, the Deviation and Error of the Compass; Great Circle Sailing; the International (Commercial) Code of Signals; the Rule of the Road at Sea; Rocket and Mortar Apparatus for Saving Life; the Law of Storms; and a Brief Dictionary of Sea Terms. With numerous Woodcuts and Coloured Plates of Flags. New, thoroughly revised and much enlarged edition. By W. H. ROSSER. 2s. 6d.‡
80. *MARINE ENGINES, AND STEAM VESSELS*, a Treatise on. Together with Practical Remarks on the Screw and Propelling Power, as used in the Royal and Merchant Navy. By ROBERT MURRAY, C.E., Engineer-Surveyor to the Board of Trade. With a Glossary of Technical Terms, and their Equivalents in French, German, and Spanish. Seventh Edition, revised and enlarged. Illustrated. 3s.‡
- 83bis. *THE FORMS OF SHIPS AND BOATS*: Hints, Experimentally Derived, on some of the Principles regulating Ship-building. By W. BLAND. Seventh Edition, revised, with numerous Illustrations and Models. 1s. 6d.
99. *NAVIGATION AND NAUTICAL ASTRONOMY*, in Theory and Practice. With Attempts to facilitate the Finding of the Time and the Longitude at Sea. By J. R. YOUNG, formerly Professor of Mathematics in Belfast College. Illustrated. 2s. 6d.
- 100*. *TABLES* intended to facilitate the Operations of Navigation and Nautical Astronomy, as an Accompaniment to the above Book. By J. R. YOUNG. 1s. 6d.
106. *SHIPS' ANCHORS*, a Treatise on. By G. COTSELL, N.A. 1s. 6d.
149. *SAILS AND SAIL-MAKING*, an Elementary Treatise on. With Draughting, and the Centre of Effort of the Sails. Also, Weights and Sizes of Ropes; Mastng, Rigging, and Sails of Steam Vessels, &c., &c. Eleventh Edition, enlarged, with an Appendix. By ROBERT KIPPING, N.A., Sailmaker, Quayside, Newcastle. Illustrated. 2s. 6d.‡
155. *THE ENGINEER'S GUIDE TO THE ROYAL AND MERCANTILE NAVIES*. By a PRACTICAL ENGINEER. Revised by D. F. MC CARTHY, late of the Ordnance Survey Office, Southampton. 3s.
- 55 & 204. *PRACTICAL NAVIGATION*. Consisting of The Sailor's Sea-Book. By JAMES GREENWOOD and W. H. ROSSER. Together with the requisite Mathematical and Nautical Tables for the Working of the Problems. By HENRY LAW, C.E., and J. R. YOUNG, formerly Professor of Mathematics in Belfast College. Illustrated with numerous Wood Engravings and Coloured Plates. 7s. Strongly half-bound in leather.

§23 The ‡ indicates that these vols. may be had strongly bound at 6d. extra.

LONDON: CROSBY LOCKWOOD AND CO.,

PHYSICAL SCIENCE, NATURAL PHILOSOPHY, ETC.

1. **CHEMISTRY**, for the Use of Beginners. By Professor GEORGE FOWNES, F.R.S. With an Appendix on the Application of Chemistry to Agriculture. 1s.
2. **NATURAL PHILOSOPHY**, Introduction to the Study of; for the Use of Beginners. By C. TOMLINSON, Lecturer on Natural Science in King's College School, London. Woodcuts. 1s. 6d.
4. **MINERALOGY**, Rudiments of; a concise View of the Properties of Minerals. By A. RAMSAY, Jun. Woodcuts and Steel Plates. 3s. 1/2
6. **MECHANICS**, Rudimentary Treatise on; being a concise Exposition of the General Principles of Mechanical Science, and their Applications. By CHARLES TOMLINSON. Illustrated. 1s. 6d.
7. **ELECTRICITY**; showing the General Principles of Electrical Science, and the purposes to which it has been applied. By Sir W. SNOW HARRIS, F.R.S., &c. With Additions by R. SABINE, C.E., F.S.A. 1s. 6d.
- 7*. **GALVANISM**, Rudimentary Treatise on, and the General Principles of Animal and Voltaic Electricity. By Sir W. SNOW HARRIS. New Edition, with considerable Additions by ROBERT SABINE, C.E., F.S.A. 1s. 6d.
8. **MAGNETISM**; being a concise Exposition of the General Principles of Magnetical Science, and the Purposes to which it has been applied. By Sir W. SNOW HARRIS. New Edition, revised and enlarged by H. M. NOAD, Ph.D., Vice-President of the Chemical Society, Author of "A Manual of Electricity," &c., &c. With 165 Woodcuts. 3s. 6d. 1/2
11. **THE ELECTRIC TELEGRAPH**; its History and Progress; with Descriptions of some of the Apparatus. By R. SABINE, C.E., F.S.A. 3s.
12. **PNEUMATICS**, for the Use of Beginners. By CHARLES TOMLINSON. Illustrated. 1s. 6d.
72. **MANUAL OF THE MOLLUSCA**; a Treatise on Recent and Fossil Shells. By Dr. S. P. WOODWARD, A.L.S. Fourth Edition. With Appendix by RALPH TATE, A.L.S., F.G.S. With numerous Plates and 300 Woodcuts. 6s. 6d. Cloth boards, 7s. 6d.
- 79**. **PHOTOGRAPHY**, Popular Treatise on; with a Description of the Stereoscope, &c. Translated from the French of D. VAN MONCKHOVEN, by W. H. THORNTWHAITE, Ph.D. Woodcuts. 1s. 6d.
96. **ASTRONOMY**. By the Rev. R. MAIN, M.A., F.R.S., &c. New Edition, with an Appendix on "Spectrum Analysis." Woodcuts. 1s. 6d.
97. **STATICS AND DYNAMICS**, the Principles and Practice of; embracing also a clear development of Hydrostatics, Hydrodynamics, and Central Forces. By T. BAKER, C.E. 1s. 6d.
138. **TELEGRAPH**, Handbook of the; a Manual of Telegraphy, Telegraph Clerks' Remembrancer, and Guide to Candidates for Employment in the Telegraph Service. By R. BOND. Fourth Edition, revised and enlarged; to which is appended, QUESTIONS on MAGNETISM, ELECTRICITY, and PRACTICAL TELEGRAPHY, for the Use of Students, by W. MCGREGOR, First Assistant Supnt., Indian Gov. Telegraphs. 3s. 1/2
143. **EXPERIMENTAL ESSAYS**. By CHARLES TOMLINSON. I. On the Motions of Camphor on Water. II. On the Motion of Camphor towards the Light. III. History of the Modern Theory of Dew. Woodcuts. 1s.
173. **PHYSICAL GEOLOGY**, partly based on Major-General PORTLOCK's "Rudiments of Geology." By RALPH TATE, A.L.S., &c. Woodcuts. 2s.
174. **HISTORICAL GEOLOGY**, partly based on Major-General PORTLOCK's "Rudiments." By RALPH TATE, A.L.S., &c. Woodcuts. 2s. 6d.
173. **RUDIMENTARY TREATISE ON GEOLOGY**, Physical and Historical. Partly based on Major-General PORTLOCK's "Rudiments of Geology." By RALPH TATE, A.L.S., F.G.S., &c. In One Volume. 4s. 6d. 1/2
183. **ANIMAL PHYSICS**, Handbook of. By Dr. LARDNER, D.C.L., &c. formerly Professor of Natural Philosophy and Astronomy in University College, Lond. With 520 Illustrations. In One Vol. 7s. 6d., cloth boards.
184. ** Sold also in Two Parts, as follows:—
 183. **ANIMAL PHYSICS**. By Dr. LARDNER. Part I., Chapters I.—VII. 4s.
 184. **ANIMAL PHYSICS**. By Dr. LARDNER. Part II., Chapters VIII.—XVIII. 3s.

 The † indicates that these vols. may be had strongly bound at 6d. extra.


7, STATIONERS' HALL COURT, LUDGATE HILL, E.C.

MINING, METALLURGY, ETC.

117. *SUBTERRANEAN SURVEYING*, Elementary and Practical Treatise on, with and without the Magnetic Needle. By THOMAS FENWICK, Surveyor of Mines, and THOMAS BAKER, C.E. Illustrated. 2s. 6d.†
133. *METALLURGY OF COPPER*; an Introduction to the Methods of Seeking, Mining, and Assaying Copper, and Manufacturing its Alloy. By ROBERT H. LAMBORN, Ph.D. Woodcuts. 2s. 6d.†
134. *METALLURGY OF SILVER AND LEAD*. A Description of the Ores; their Assay and Treatment, and valuable Constituents. By Dr. R. H. LAMBORN. Woodcuts. 2s. 6d.†
135. *ELECTRO-METALLURGY*; Practically Treated. By ALEXANDER WATT, F.R.S.S.A. 7th Edition, revised, with important additions, including the Electro-Deposition of Nickel, &c. Woodcuts. 3s.†
172. *MINING TOOLS*, Manual of. For the Use of Mine Managers, Agents, Students, &c. By WILLIAM MORGANS. 2s. 6d.†
- 172*. *MINING TOOLS, ATLAS* of Engravings to Illustrate the above, containing 235 Illustrations, drawn to Scale. 4to. 4s. 6d.; cloth boards, 6s.
176. *METALLURGY OF IRON*. Containing History of Iron Manufacture, Methods of Assay, and Analyses of Iron Ores, Processes of Manufacture of Iron and Steel, &c. By H. BAUERMAN, F.G.S. 4th Edition. 4s. 6d.†
180. *COAL AND COAL MINING*, A Rudimentary Treatise on. By WARINGTON W. SMYTH, M.A., F.R.S. Fifth Edition, revised and enlarged. With numerous Illustrations. 3s. 6d.† [Just published.]
195. *THE MINERAL SURVEYOR AND VALUER'S COMPLETE GUIDE*, with new Traverse Tables, and Descriptions of Improved Instruments; also the Correct Principles of Laying out and Valuing Mineral Properties. By WILLIAM LINTERN, Mining and Civil Engineer. 3s. 6d.†
214. *SLATE AND SLATE QUARRYING*, Scientific, Practical, and Commercial. By D. C. DAVIES, F.G.S., Mining Engineer, &c. With numerous Illustrations and Folding Plates. 3s.†
215. *THE GOLDSMITH'S HANDBOOK*, containing full Instructions for the Alloying and Working of Gold, including the Art of Alloying, Melting, Reducing, Colouring, Collecting, and Refining; Chemical and Physical Properties of Gold; with a New System of Mixing its Alloys; Solders, Enamels, &c. By GEORGE E. GEE, Goldsmith and Silversmith. Second Edition, considerably enlarged. 3s.† [Just published.]
- THE SILVERSMITH'S HANDBOOK*, containing full Instructions for the Alloying and Working of Silver. By GEORGE E. GEE. 3s.†
220. *MAGNETIC SURVEYING, AND ANGULAR SURVEYING*, with Records of the Peculiarities of Needle Disturbances. Compiled from the Results of carefully made Experiments. By WILLIAM LINTERN, Mining and Civil Engineer and Surveyor. 2s. [Just published.]

FINE ARTS.

20. *PERSPECTIVE FOR BEGINNERS*. Adapted to Young Students and Amateurs in Architecture, Painting, &c. By GEORGE PYNE. 2s.
40. *GLASS STAINING*; or, The Art of Painting on Glass. From the German of Dr. GESSERT. With an Appendix on THE ART OF ENAMELLING, &c.; together with THE ART OF PAINTING ON GLASS. From the German of EMANUEL OTTO FROMBERG. In One Volume. 2s. 6d.
41. *MUSIC*, A Rudimentary and Practical Treatise on. With numerous Examples. By CHARLES CHILD SPENCER. 2s. 6d.
71. *PIANOFORTE*, The Art of Playing the. With numerous Exercises & Lessons. From the Best Masters, by CHARLES CHILD SPENCER. 1s. 6l.
181. *PAINTING POPULARLY EXPLAINED*, including Fresco, Oil, Mosaic, Water Colour, Water-Glass, Tempera, Encaustic, Miniature, Painting on Ivory, Vellum, Pottery, Enamel, Glass, &c. With Historical Sketches of the Progress of the Art by THOMAS JOHN GULLICK, assisted by JOHN TIMBS, F.S.A. Fourth Edition, revised and enlarged. 5s.†
186. *A GRAMMAR OF COLOURING*, applied to Decorative Painting and the Arts. By GEORGE FIELD. New Edition, enlarged and adapted to the Use of the Ornamental Painter and Designer. By ELLIS A. DAVIDSON. With two new Coloured Diagrams, &c. 3s.†

 The † indicates that these vols. may be had strongly bound at 6d. extra.


AGRICULTURE, GARDENING, ETC.

29. *THE DRAINAGE OF DISTRICTS AND LANDS.* By G. DRYSDALE DEMPSEY, C.E. [*New Edition in preparation.*]
66. *CLAY LANDS & LOAMY SOILS.* By Prof. DONALDSON. 1s.
131. *MILLER'S, MERCHANT'S, AND FARMER'S READY RECKONER*, for ascertaining at sight the value of any quantity of Corn, from One Bushel to One Hundred Quarters, at any given price, from £1 to £5 per Or. With approximate values of Millstones, Millwork, &c. 1s.
140. *SOILS, MANURES, AND CROPS.* (Vol. 1. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. Woodcuts. 2s.
141. *FARMING & FARMING ECONOMY*, Notes, Historical and Practical, on. (Vol. 2. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. 3s.
142. *STOCK; CATTLE, SHEEP, AND HORSES.* (Vol. 3. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. Woodcuts. 2s. 6d.
145. *DAIRY, PIGS, AND POULTRY*, Management of the. By R. SCOTT BURN. With Notes on the Diseases of Stock. (Vol. 4. OUTLINES OF MODERN FARMING.) Woodcuts. 2s.
146. *UTILIZATION OF SEWAGE, IRRIGATION, AND RECLAMATION OF WASTE LAND.* (Vol. 5. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. Woodcuts. 2s. 6d.
- * Nos. 140-1-2-5-6, in One Vol., handsomely half-bound, entitled "OUTLINES OF MODERN FARMING." By ROBERT SCOTT BURN. Price 12s.
177. *FRUIT TREES*, The Scientific and Profitable Culture of. From the French of DU BREUIL. Revised by GEO. GLENNY. 187 Woodcuts. 3s. 6d.†
198. *SHEEP: THE HISTORY, STRUCTURE, ECONOMY, AND DISEASES OF.* By W. C. SPOONER, M.R.V.C., &c. Fourth Edition, considerably enlarged; with numerous fine engravings, including some specimens of New and Improved Breeds. 366 pp. 3s. 6d.†
201. *KITCHEN GARDENING MADE EASY.* Showing how to prepare and lay out the ground, the best means of cultivating every known Vegetable and Herb, with cultural directions for the management of them all the year round. By GEORGE M.F. GLENNY, Author of "Floriculture," &c. 1s. 6d.†
207. *OUTLINES OF FARM MANAGEMENT, and the Organization of Farm Labour:* Treating of the General Work of the Farm; Field and Live Stock; Details of Contract Work; Specialities of Labour; Economical Management of the Farmhouse and Cottage, and their Domestic Animals. By ROBERT SCOTT BURN. 2s. 6d.† [*Just published.*]
208. *OUTLINES OF LANDED ESTATES MANAGEMENT:* Treating of the Varieties of Lands, Methods of Farming, Farm Buildings, Irrigation, Drainage, &c. By R. SCOTT BURN. 2s. 6d.†
- * Nos. 207 & 208 in One Vol., handsomely half-bound, entitled "OUTLINES OF LANDED ESTATES AND FARM MANAGEMENT." By R. SCOTT BURN. Price 6s.
209. *THE TREE PLANTER AND PLANT PROPAGATOR:* Being a Practical Manual on the Propagation of Forest Trees, Fruit Trees, Flowering Shrubs, Flowering Plants, Pot-Herbs, &c.; with numerous Illustrations of Grafting, Layering, Budding, Cuttings, &c., Useful Implements, Houses, Pits, &c. By SAMUEL WOOD. 2s.† [*Just published.*]
210. *THE TREE PRUNER:* Being a Practical Manual on the Pruning of Fruit Trees, including also their Training and Renovation; also treating of the Pruning of Shrubs, Climbers and Flowering Plants. By SAMUEL WOOD. 2s.† [*Just published.*]
- * Nos. 209 & 210 in One Vol., handsomely half-bound, entitled "THE TREE PLANTER, PROPAGATOR AND PRUNER." By SAMUEL WOOD. Price 5s.
219. *THE HAY AND STRAW MEASURER:* Being New Tables for the Use of Auctioneers, Valuers, Farmers, Hay and Straw Dealers, &c., forming a complete Calculator and Ready-Reckoner, especially adapted to persons connected with Agriculture. Third Edition. By JOHN STEBLE. 2s.
222. *SUBURBAN FARMING.* The Laying-out and Cultivation of Farms, adapted to the Produce of Milk, Butter, and Cheese, Eggs, Poultry, and Pigs. By the late Prof. JOHN DONALDSON. With Additions by R. SCOTT BURN. Second Edition. 3s. 6d.† [*Just published.*]

† The † indicates that these vols. may be had strongly bound at 6d. extra.

ARITHMETIC, GEOMETRY, MATHEMATICS, ETC.

32. **MATHEMATICAL INSTRUMENTS**, a Treatise on; in which their Construction and the Methods of Testing, Adjusting, and Using them are concisely Explained. By J. F. HEATHER, M.A., of the Royal Military Academy, Woolwich. Original Edition, in 1 vol., Illustrated. 1s. 6d.
- *. In ordering the above, be careful to say, "Original Edition" (No. 32), to distinguish it from the Enlarged Edition in 3 vols. (Nos. 168-9-70.)
60. **LAND AND ENGINEERING SURVEYING**, a Treatise on; with all the Modern Improvements. Arranged for the Use of Schools and Private Students; also for Practical Land Surveyors and Engineers. By T. BAKER, C.E. New Edition, revised by EDWARD NUGENT, C.E. Illustrated with Plates and Diagrams. 2s. 4
- 61*. **READY RECKONER FOR THE ADMEASUREMENT OF LAND**. By ABRAHAM ARMAN, Schoolmaster, Thurleigh, Beds. To which is added a Table, showing the Price of Work, from 2s. 6d. to £1 per acre, and Tables for the Valuation of Land, from 1s. to £1,000 per acre, and from one pole to two thousand acres in extent, &c., &c. 1s. 6d.
76. **DESCRIPTIVE GEOMETRY**, an Elementary Treatise on; with a Theory of Shadows and of Perspective, extracted from the French of G. MONGE. To which is added, a description of the Principles and Practice of Isometrical Projection; the whole being intended as an introduction to the Application of Descriptive Geometry to various branches of the Arts. By J. F. HEATHER, M.A. Illustrated with 14 Plates. 2s.
178. **PRACTICAL PLANE GEOMETRY**: giving the Simplest Modes of Constructing Figures contained in one Plane and Geometrical Construction of the Ground. By J. F. HEATHER, M.A. With 215 Woodcuts. 2s.
179. **PROJECTION**: Orthographic, Topographic, and Perspective: giving the various Modes of Delineating Solid Forms by Constructions on a Single Plane Surface. By J. F. HEATHER, M.A. [In preparation.]
- *. The above three volumes will form a COMPLETE ELEMENTARY COURSE OF MATHEMATICAL DRAWING.
83. **COMMERCIAL BOOK-KEEPING**. With Commercial Phrases and Forms in English, French, Italian, and German. By JAMES HADDON, M.A., Arithmetical Master of King's College School, London. 1s. 6d.
84. **ARITHMETIC**, a Rudimentary Treatise on: with full Explanations of its Theoretical Principles, and numerous Examples for Practice. For the Use of Schools and for Self-Instruction. By J. R. YOUNG, late Professor of Mathematics in Belfast College. New Edition, with Index. 1s. 6d.
- 84*. A KEY to the above, containing Solutions in full to the Exercises, together with Comments, Explanations, and Improved Processes, for the Use of Teachers and Unassisted Learners. By J. R. YOUNG. 1s. 6d.
85. **EQUATIONAL ARITHMETIC**, applied to Questions of Interest,
- 85*. Annuities, Life Assurance, and General Commerce; with various Tables by which all Calculations may be greatly facilitated. By W. HIFLEY. 2s.
86. **ALGEBRA**, the Elements of. By JAMES HADDON, M.A., Second Mathematical Master of King's College School. With Appendix, containing miscellaneous Investigations, and a Collection of Problems in various parts of Algebra. 2s.
- 86*. A KEY AND COMPANION to the above Book, forming an extensive repository of Solved Examples and Problems in Illustration of the various Expedients necessary in Algebraical Operations. Especially adapted for Self-Instruction. By J. R. YOUNG. 1s. 6d.
88. **EUCLID, THE ELEMENTS OF**: with many additional Propositions
89. and Explanatory Notes: to which is prefixed, an Introductory Essay on Logic. By HENRY LAW, C.E. 2s. 6d. 4
- *. Sold also separately, viz. :—
88. EUCLID, The First Three Books. By HENRY LAW, C.E. 1s. 6d.
89. EUCLID, Books 4, 5, 6, 11, 12. By HENRY LAW, C.E. 1s. 6d.

 The 4 indicates that these vols. may be had strongly bound at 6d. extra.

LONDON: CROSBY LOCKWOOD AND CO.,

ithmetic, Geometry, Mathematics, etc., *continued.*

- o. **ANALYTICAL GEOMETRY AND CONIC SECTIONS**, a Rudimentary Treatise on. By JAMES HANN, late Mathematical Master of King's College School, London. A New Edition, re-written and enlarged by J. R. YOUNG, formerly Professor of Mathematics at Belfast College. 2s.†
 1. **PLANE TRIGONOMETRY**, the Elements of. By JAMES HANN, formerly Mathematical Master of King's College, London. 1s. 6d.
 2. **SPHERICAL TRIGONOMETRY**, the Elements of. By JAMES HANN. Revised by CHARLES H. DOWLING, C.E. 1s.
* Or with "*The Elements of Plane Trigonometry*," in One Volume, 2s. 6d.
 3. **MENSURATION AND MEASURING**, for Students and Practical Use. With the Mensuration and Levelling of Land for the Purposes of Modern Engineering. By T. BAKER, C.E. New Edition, with Corrections and Additions by E. NUGENT, C.E. Illustrated. 1s. 6d.
 2. **INTEGRAL CALCULUS**, Rudimentary Treatise on the. By HOMERSHAM COX, B.A. Illustrated. 1s.
 3. **INTEGRAL CALCULUS**, Examples on the. By JAMES HANN, late of King's College, London. Illustrated. 1s.
 1. **DIFFERENTIAL CALCULUS**, Elements of the. By W. S. B. WOOLHOUSE, F.R.A.S., &c. 1s. 6d.
 5. **MNEMONICAL LESSONS**.—GEOMETRY, ALGEBRA, AND TRIGONOMETRY, in Easy Mnemonical Lessons. By the Rev. THOMAS PENYNGTON KIRKMAN, M.A. 1s. 6d.
 5. **ARITHMETIC**, Rudimentary, for the Use of Schools and Self-Instruction. By JAMES HADDON, M.A. Revised by ABRAHAM ARMAN. 1s. 6d.
 1. **A KEY TO HADDON'S RUDIMENTARY ARITHMETIC**. By A. ARMAN. 1s. 6d.
 3. **DRAWING AND MEASURING INSTRUMENTS**. Including—I. Instruments employed in Geometrical and Mechanical Drawing, and in the Construction, Copying, and Measurement of Maps and Plans. II. Instruments used for the purposes of Accurate Measurement, and for Arithmetical Computations. By J. F. HEATHER, M.A., late of the Royal Military Academy, Woolwich, Author of "*Descriptive Geometry*," &c., &c. Illustrated. 1s. 6d.
 3. **OPTICAL INSTRUMENTS**. Including (more especially) Telescopes, Microscopes, and Apparatus for producing copies of Maps and Plans by Photography. By J. F. HEATHER, M.A. Illustrated. 1s. 6d.
 1. **SURVEYING AND ASTRONOMICAL INSTRUMENTS**. Including—I. Instruments Used for Determining the Geometrical Features of a portion of Ground. II. Instruments Employed in Astronomical Observations. By J. F. HEATHER, M.A. Illustrated. 1s. 6d.
- The above three volumes form an enlargement of the Author's original work, 'Mathematical Instruments: their Construction, Adjustment, Testing, and Use,' the Thirteenth Edition of which is on sale, price 1s. 6d. (See No. 32 in the Series.)*
1. } **MATHEMATICAL INSTRUMENTS**. By J. F. HEATHER,
1. } M.A. Enlarged Edition, for the most part entirely re-written. The 3 Parts as
1. } above, in One thick Volume. With numerous Illustrations. 4s. 6d.†
 1. **THE SLIDE RULE, AND HOW TO USE IT**; containing full, easy, and simple Instructions to perform all Business Calculations with unexampled rapidity and accuracy. By CHARLES HOARE, C.E. With a Slide Rule in tuck of cover. 2s. 6d.†
 1. **THE COMPLETE MEASURER**; setting forth the Measurement of Boards, Glass, &c., &c.; Unequal-sided, Square-sided, Octagonal-sided, Round Timber and Stone, and Standing Timber. With a Table showing the solidity of hewn or eight-sided timber, or of any octagonal-sided column. Compiled for Timber-growers, Merchants, and Surveyors, Stonemasons, Architects, and others. By RICHARD HORTON. Third Edition, with valuable additions. 4s.; strongly bound in leather, 5s.
 1. **THEORY OF COMPOUND INTEREST AND ANNUITIES**; with Tables of Logarithms for the more Difficult Computations of Interest, Discount, Annuities, &c. By FÉDOR THOMAN. 4s.†

† The † indicates that these vols. may be had strongly bound at 6d. extra.

7, STATONERS' HALL COURT, LUDGATE HILL, E.C.

Arithmetic, Geometry, Mathematics, etc., continued.

199. *INTUITIVE CALCULATIONS*; or, Easy and Compendious Methods of Performing the various Arithmetical Operations required in Commercial and Business Transactions; together with Full Explanations of Decimals and Duodecimals, several Useful Tables, &c. By DANIEL O'GORMAN. Twenty-fifth Edition, corrected and enlarged by J. R. YOUNG, formerly Professor of Mathematics in Belfast College. 3s.†
204. *MATHEMATICAL TABLES*, for Trigonometrical, Astronomical, and Nautical Calculations; to which is prefixed a Treatise on Logarithms. By HENRY LAW, C.E. Together with a Series of Tables for Navigation and Nautical Astronomy. By J. R. YOUNG, formerly Professor of Mathematics in Belfast College. New Edition. 3s. 6d.†
221. *MEASURES, WEIGHTS, AND MONEYS OF ALL NATIONS*, and an Analysis of the Christian, Hebrew, and Mahometan Calendars. By W. S. B. WOOLHOUSE, F.R.A.S., F.S.S. Sixth Edition, carefully revised and enlarged. 2s.† *[Just published]*

MISCELLANEOUS VOLUMES.

36. *A DICTIONARY OF TERMS used in ARCHITECTURE, BUILDING, ENGINEERING, MINING, METALLURGY, ARCHÆOLOGY, the FINE ARTS, &c.* By JOHN WEALE. Fifth Edition. Revised by ROBERT HUNT, F.R.S., Keeper of Mining Records. Numerous Illustrations. 5s. cloth limp; 6s. cloth boards.
50. *THE LAW OF CONTRACTS FOR WORKS AND SERVICES.* By DAVID GIBBONS. Third Edition, enlarged. 3s.†
112. *MANUAL OF DOMESTIC MEDICINE.* By R. GOODING, B.A., M.D. Intended as a Family Guide in all Cases of Accident and Emergency. 2s.†
- 112*. *MANAGEMENT OF HEALTH.* A Manual of Home and Personal Hygiene. By the Rev. JAMES BAIRD, B.A. 1s.
150. *LOGIC, Pure and Applied.* By S. H. EMMENS. 1s. 6d.
152. *PRACTICAL HINTS FOR INVESTING MONEY.* With an Explanation of the Mode of Transacting Business on the Stock Exchange. By FRANCIS PLAYFORD, Sworn Broker. 1s. 6d.
153. *SELECTIONS FROM LOCKE'S ESSAYS ON THE HUMAN UNDERSTANDING.* With Notes by S. H. EMMENS. 2s.
154. *GENERAL HINTS TO EMIGRANTS.* Containing Notices of the various Fields for Emigration. With Hints on Preparation for Emigrating, Outfits, &c., &c. With Directions and Recipes useful to the Emigrant. With a Map of the World. 2s.
157. *THE EMIGRANT'S GUIDE TO NATAL.* By ROBERT JAMES MANN, F.R.A.S., F.M.S. Second Edition, carefully corrected to the present Date. Map. 2s.
193. *HANDBOOK OF FIELD FORTIFICATION*, intended for the Guidance of Officers Preparing for Promotion, and especially adapted to the requirements of Beginners. By Major W. W. KNOLLYS, F.R.G.S., 93rd Sutherland Highlanders, &c. With 163 Woodcuts. 3s.†
194. *THE HOUSE MANAGER: Being a Guide to Housekeeping.* Practical Cookery, Pickling and Preserving, Household Work, Dairy Management, the Table and Dessert, Cellarage of Wines, Home-brewing and Wine-making, the Boudoir and Dressing-room, Travelling, Stable Economy, Gardening Operations, &c. By AN OLD HOUSEKEEPER. 3s. 6d.†
194. *HOUSE BOOK (The).* Comprising:—I. THE HOUSE MANAGER. II. By AN OLD HOUSEKEEPER. II. DOMESTIC MEDICINE. By RALPH GOODING, M.D. III. MANAGEMENT OF HEALTH. By JAMES BAIRD. In One Vol., & strongly half-bound. 6s.
- 112*.
224. *COACH BUILDING*, A Practical Treatise, Historical and Descriptive, containing full information of the various Trades and Processes involved, with Hints on the proper Keeping of Carriages, &c. With 57 Illustrations. By JAMES W. BURGESS. 2s. 6d.† *[Just published.]*

† The † indicates that these vols. may be had strongly bound at 6d. extra.

EDUCATIONAL AND CLASSICAL SERIES.**HISTORY.**

1. **England, Outlines of the History of;** more especially with reference to the Origin and Progress of the English Constitution. By WILLIAM DOUGLAS HAMILTON, F.S.A., of Her Majesty's Public Record Office. 4th Edition, revised. 5s.; cloth boards, 6s.
5. **Greece, Outlines of the History of;** in connection with the Rise of the Arts and Civilization in Europe. By W. DOUGLAS HAMILTON, of University College, London, and EDWARD LEVIEN, M.A., of Balliol College, Oxford. 2s. 6d.; cloth boards, 3s. 6d.
7. **Rome, Outlines of the History of;** from the Earliest Period to the Christian Era and the Commencement of the Decline of the Empire. By EDWARD LEVIEN, of Balliol College, Oxford. Map, 2s. 6d.; cl. bds. 3s. 6d.
9. **Chronology of History, Art, Literature, and Progress,** from the Creation of the World to the Conclusion of the Franco-German War. The Continuation by W. D. HAMILTON, F.S.A. 3s.; cloth boards, 3s. 6d.
10. **Dates and Events in English History,** for the use of Candidates in Public and Private Examinations. By the Rev. E. RAND. 1s.

ENGLISH LANGUAGE AND MISCELLANEOUS.

1. **Grammar of the English Tongue, Spoken and Written.** With an Introduction to the Study of Comparative Philology. By HYDE CLARKE, D.C.L. Fourth Edition. 1s. 6d.
- *. **Philology:** Handbook of the Comparative Philology of English, Anglo-Saxon, Frisian, Flemish or Dutch, Low or Platt Dutch, High Dutch or German, Danish, Swedish, Icelandic, Latin, Italian, French, Spanish, and Portuguese Tongues. By HYDE CLARKE, D.C.L. 1s.
2. **Dictionary of the English Language,** as Spoken and Written. Containing above 100,000 Words. By HYDE CLARKE, D.C.L. 3s. 6d.; cloth boards, 4s. 6d.; complete with the GRAMMAR, cloth bds., 5s. 6d.
3. **Composition and Punctuation,** familiarly Explained for those who have neglected the Study of Grammar. By JUSTIN BRENNAN. 17th Edition. 1s. 6d.
19. **Derivative Spelling-Book:** Giving the Origin of Every Word from the Greek, Latin, Saxon, German, Teutonic, Dutch, French, Spanish, and other Languages; with their present Acceptation and Pronunciation. By J. ROWBOTHAM, F.R.A.S. Improved Edition. 1s. 6d.
31. **The Art of Extempore Speaking:** Hints for the Pulpit, the Senate, and the Bar. By M. BAUTAIN, Vicar-General and Professor at the Sorbonne. Translated from the French. 7th Edition, carefully corrected. 2s. 6d.
52. **Mining and Quarrying,** with the Sciences connected therewith. First Book of, for Schools. By J. H. COLLINS, F.G.S., Lecturer to the Miners' Association of Cornwall and Devon. 1s.
53. **Places and Facts in Political and Physical Geography,** for Candidates in Examinations. By the Rev. EDGAR RAND, B.A. 1s.
54. **Analytical Chemistry, Qualitative and Quantitative,** a Course of. To which is prefixed, a Brief Treatise upon Modern Chemical Nomenclature and Notation. By WM. W. PINK and GEORGE E. WEBSTER. 2s.

THE SCHOOL MANAGERS' SERIES OF READING BOOKS,

adapted to the Requirements of the New Code. Edited by the Rev. A. R. GRANT, Rector of Hitcham, and Honorary Canon of Ely; formerly H.M. Inspector of Schools.

INTRODUCTORY PRIMER, 3d.

	s. d.		s. d.
FIRST STANDARD . . .	0 6	FOURTH STANDARD . . .	1 2
SECOND " . . .	0 10	FIFTH " . . .	1 6
THIRD " . . .	1 0	SIXTH " . . .	1 6
LESSONS FROM THE BIBLE. Part I. Old Testament.	1s.		
LESSONS FROM THE BIBLE. Part II. New Testament, to which is added THE GEOGRAPHY OF THE BIBLE, for very young Children. By Rev. C. THORNTON FORSTER. 1s. 2d.			

. Or the Two Parts in One Volume. 2s.

FRENCH.

24. **French Grammar.** With Complete and Concise Rules on the Genders of French Nouns. By G. L. STRAUSS, Ph.D. 1s. 6d.
25. **French-English Dictionary.** Comprising a large number of New Terms used in Engineering, Mining, &c. By ALFRED ELWES. 1s. 6d.
26. **English French Dictionary.** By ALFRED ELWES. 2s.
- 25, 26. **French Dictionary** (as above). Complete, in One Vol., 3s.; cloth boards, 3s. 6d. * * * Or with the GRAMMAR, cloth boards, 4s. 6d.
47. **French and English Phrase Book:** containing Introductory Lessons, with Translations, several Vocabularies of Words, a Collection of suitable Phrases, and Easy Familiar Dialogues. 1s. 6d.

GERMAN.

39. **German Grammar.** Adapted for English Students, from Heyse's Theoretical and Practical Grammar, by Dr. G. L. STRAUSS. 1s.
40. **German Reader:** A Series of Extracts, carefully culled from the most approved Authors of Germany; with Notes, Philological and Explanatory. By G. L. STRAUSS, Ph.D. 1s.
- 41-43. **German Triglot Dictionary.** By NICHOLAS ESTERHAZY S. A. HAMILTON. In Three Parts. Part I. German-French-English. Part II. English-German-French. Part III. French-German-English. 3s., or cloth boards, 4s.
- 41-43. **German Triglot Dictionary** (as above), together with German & 39. Grammar (No. 39), in One Volume, cloth boards, 5s.

ITALIAN.

27. **Italian Grammar,** arranged in Twenty Lessons, with a Course of Exercises. By ALFRED ELWES. 1s. 6d.
28. **Italian Triglot Dictionary,** wherein the Genders of all the Italian and French Nouns are carefully noted down. By ALFRED ELWES. Vol. I. Italian-English-French. 2s. 6d.
30. **Italian Triglot Dictionary.** By A. ELWES. Vol. 2. English-French-Italian. 2s. 6d.
32. **Italian Triglot Dictionary.** By ALFRED ELWES. Vol. 3. French-Italian-English. 2s. 6d.
- 28, 30, 32. **Italian Triglot Dictionary** (as above). In One Vol., 7s. 6d. Cloth boards.

SPANISH AND PORTUGUESE.

34. **Spanish Grammar,** in a Simple and Practical Form. With a Course of Exercises. By ALFRED ELWES. 1s. 6d.
35. **Spanish-English and English-Spanish Dictionary.** Including a large number of Technical Terms used in Mining, Engineering, &c., with the proper Accents and the Gender of every Noun. By ALFRED ELWES. 4s.; cloth boards, 5s. * * * Or with the GRAMMAR, cloth boards, 6s.
55. **Portuguese Grammar,** in a Simple and Practical Form. With a Course of Exercises. By ALFRED ELWES. 1s. 6d.
56. **Portuguese-English and English-Portuguese Dictionary,** with the Genders of each Noun. By ALFRED ELWES.

*[In preparation.]***HEBREW.**

- 46*. **Hebrew Grammar.** By Dr. BRESSLAU. 1s. 6d.
44. **Hebrew and English Dictionary,** Biblical and Rabbinical; containing the Hebrew and Chaldee Roots of the Old Testament Post-Rabbinical Writings. By Dr. BRESSLAU. 6s. * * * Or with the GRAMMAR, 7s.
46. **English and Hebrew Dictionary.** By Dr. BRESSLAU. 3s.
- 44, 46. **Hebrew Dictionary** (as above), in Two Vols., complete, with 46*. the GRAMMAR, cloth boards, 12s.

LONDON: CROSBY LOCKWOOD AND CO.,

LATIN.

19. **Latin Grammar.** Containing the Inflections and Elementary Principles of Translation and Construction. By the Rev. THOMAS GOODWIN, M.A., Head Master of the Greenwich Proprietary School. 1s.
20. **Latin-English Dictionary.** By the Rev. THOMAS GOODWIN, M.A. 2s.
22. **English-Latin Dictionary;** together with an Appendix of French and Italian Words which have their origin from the Latin. By the Rev. THOMAS GOODWIN, M.A. 1s. 6d.
- 20, 22. **Latin Dictionary** (as above). Complete in One Vol., 3s. 6d.; cloth boards, 4s. 6d. * Or with the GRAMMAR, cloth boards, 5s. 6d.

LATIN CLASSICS. With Explanatory Notes in English.

1. **Latin Delectus.** Containing Extracts from Classical Authors, with Genealogical Vocabularies and Explanatory Notes, by H. YOUNG. 1s. 6d.
2. **Cæsar's Commentarii de Bello Gallico.** Notes, and a Geographical Register for the Use of Schools, by H. YOUNG. 2s.
3. **Cornelius Nepos.** With Notes. By H. YOUNG. 1s.
4. **Virgilii Maronis Bucolica et Georgica.** With Notes on the Bucolics by W. RUSHTON, M.A., and on the Georgics by H. YOUNG. 1s. 6d.
5. **Virgilii Maronis Æneis.** With Notes, Critical and Explanatory, by H. YOUNG. New Edition, revised and improved. With copious Additional Notes by Rev. T. H. L. LEARY, D.C.L., formerly Scholar of Brasenose College, Oxford. 3s.
- 5* ——— Part 1. Books i.—vi., 1s. 6d.
- 5* ——— Part 2. Books vii.—xii., 2s.
6. **Horace; Odes, Epode, and Carmen Sæculare.** Notes by H. YOUNG. 1s. 6d.
7. **Horace; Satires, Epistles, and Ars Poetica.** Notes by W. BROWN-RIGG SMITH, M.A., F.R.G.S. 1s. 6d.
8. **Sallustii Crispi Catalina et Bellum Jugurthinum.** Notes, Critical and Explanatory, by W. M. DONNE, B.A., Trin. Coll., Cam. 1s. 6d.
9. **Terentii Andria et Heautontimorumenos.** With Notes, Critical and Explanatory, by the Rev. JAMES DAVIES, M.A. 1s. 6d.
10. **Terentii Adelphi, Hecyra, Phormio.** Edited, with Notes, Critical and Explanatory, by the Rev. JAMES DAVIES, M.A. 2s.
11. **Terentii Eunuchus, Comœdia.** Notes, by Rev. J. DAVIES, M.A. 1s. 6d.
12. **Ciceronis Oratio pro Sexto Roscio Amerino.** Edited, with an Introduction, Analysis, and Notes, Explanatory and Critical, by the Rev. JAMES DAVIES, M.A. 1s.
13. **Ciceronis Orationes in Catilinam, Verrem, et pro Archia.** With Introduction, Analysis, and Notes, Explanatory and Critical, by Rev. T. H. L. LEARY, D.C.L. formerly Scholar of Brasenose College, Oxford. 1s. 6d.
14. **Ciceronis Cato Major, Lælius, Brutus, sive de Senectute, de Amicitia, de Claris Oratoribus Dialogi.** With Notes by W. BROWN-RIGG SMITH, M.A., F.R.G.S. 2s.
16. **Livy: History of Rome.** Notes by H. YOUNG and W. B. SMITH, M.A. Part 1. Books i., ii., 1s. 6d.
- 16* ——— Part 2. Books iii., iv., v., 1s. 6d.
17. ——— Part 3. Books xxi., xxii., 1s. 6d.
19. **Latin Verse Selections,** from Catullus, Tibullus, Propertius, and Ovid. Notes by W. B. DONNE, M.A., Trinity College, Cambridge. 2s.
20. **Latin Prose Selections,** from Varro, Columella, Vitruvius, Seneca, Quintilian, Florus, Velleius Paterculus, Valerius Maximus Suetonius, Apuleius, &c. Notes by W. B. DONNE, M.A. 2s.
21. **Juvenalis Satiræ.** With Prolegomena and Notes by T. H. S. ESCOTT, B.A., Lecturer on Logic at King's College, London. 2s.

GREEK.

14. **Greek Grammar**, in accordance with the Principles and Philological Researches of the most eminent Scholars of our own day. By HANS CLAUDE HAMILTON. 1s. 6d.
- 15, 17. **Greek Lexicon**. Containing all the Words in General Use, with their Significations, Inflections, and Doubtful Quantities. By HENRY R. HAMILTON. Vol. 1. Greek-English, 2s. 6d.; Vol. 2. English-Greek, 2s. On the Two Vols. in One, 4s. 6d.; cloth boards, 5s.
- 14, 15. **Greek Lexicon** (as above). Complete, with the GRAMMAR, in 17. One Vol., cloth boards, 6s.

GREEK CLASSICS. With Explanatory Notes in English.

1. **Greek Delectus**. Containing Extracts from Classical Authors, with Genealogical Vocabularies and Explanatory Notes, by H. YOUNG. New Edition, with an improved and enlarged Supplementary Vocabulary, by JOHN HURCHISON, M.A., of the High School, Glasgow. 1s. 6d.
- 2, 3. **Xenophon's Anabasis**; or, The Retreat of the Ten Thousand. Notes and a Geographical Register, by H. YOUNG. Part 1. Books i. to iii., 1s. Part 2. Books iv. to vii., 1s.
4. **Lucian's Select Dialogues**. The Text carefully revised, with Grammatical and Explanatory Notes, by H. YOUNG. 1s. 6d.
- 5-12. **Homer, The Works of**. According to the Text of BAUMLEIN. With Notes, Critical and Explanatory, drawn from the best and latest Authorities, with Preliminary Observations and Appendices, by T. H. L. LEARY, M.A., D.C.L.
- | | | |
|--------------|-------------------------------------|---|
| THE ILIAD : | Part 1. Books i. to vi., 1s. 6d. | Part 3. Books xiii. to xviii., 1s. 6d. |
| | Part 2. Books vii. to xii., 1s. 6d. | Part 4. Books xix. to xxiv., 1s. 6d. |
| THE ODYSSEY. | Part 1. Books i. to vi., 1s. 6d. | Part 3. Books xiii. to xviii., 1s. 6d. |
| | Part 2. Books vii. to xii., 1s. 6d. | Part 4. Books xix. to xxiv., and Hymns, 2s. |
13. **Plato's Dialogues**: The Apology of Socrates, the Crito, and the Phædo. From the Text of C. F. HERMANN. Edited with Notes, Critical and Explanatory, by the Rev. JAMES DAVIES, M.A. 2s.
- 14-17. **Herodotus, The History of**, chiefly after the Text of GAISFORD. With Preliminary Observations and Appendices, and Notes, Critical and Explanatory, by T. H. L. LEARY, M.A., D.C.L.
- | | |
|---------|---|
| Part 1. | Books i., ii. (The Clio and Euterpe), 2s. |
| Part 2. | Books iii., iv. (The Thalia and Melpomene), 2s. |
| Part 3. | Books v.-vii. (The Terpsichore, Erato, and Polymnia), 2s. |
| Part 4. | Books viii., ix. (The Urania and Calliope) and Index, 1s. 6d. |
18. **Sophocles: Œdipus Tyrannus**. Notes by H. YOUNG. 1s.
20. **Sophocles: Antigone**. From the Text of DINDORF. Notes, Critical and Explanatory, by the Rev. JOHN MILNER, B.A. 2s.
23. **Euripides: Hecuba and Medea**. Chiefly from the Text of DINDORF. With Notes, Critical and Explanatory, by W. BROWNRIGG SMITH, M.A., F.R.G.S. 1s. 6d.
26. **Euripides: Alcestis**. Chiefly from the Text of DINDORF. With Notes, Critical and Explanatory, by JOHN MILNER, B.A. 1s. 6d.
30. **Æschylus: Prometheus Vincetus: The Prometheus Bound**. From the Text of DINDORF. Edited, with English Notes, Critical and Explanatory, by the Rev. JAMES DAVIES, M.A. 1s.
32. **Æschylus: Septem Contra Thebes: The Seven against Thebes**. From the Text of DINDORF. Edited, with English Notes, Critical and Explanatory, by the Rev. JAMES DAVIES, M.A. 1s.
40. **Aristophanes: Acharnians**. Chiefly from the Text of C. H. WEISE. With Notes, by C. S. T. TOWNSHEND, M.A. 1s. 6d.
41. **Thucydides: History of the Peloponnesian War**. Notes by H. YOUNG. Book 1. 1s.
42. **Xenophon's Panegyric on Agesilaus**. Notes and Introduction by L. F. W. JEWITT. 1s. 6d.
43. **Demosthenes: The Oration on the Crown and the Philipps**. With English Notes. By Rev. T. H. L. LEARY, D.C.L., formerly Scholar of Brasenose College, Oxford. 1s. 6d.

LONDON, May, 1881.

A Catalogue of Books

INCLUDING MANY NEW AND STANDARD WORKS IN
**ENGINEERING, ARCHITECTURE, AGRICULTURE,
MATHEMATICS, MECHANICS, SCIENCE, ETC.**

PUBLISHED BY

CROSBY LOCKWOOD & CO.,
7, STATIONERS'-HALL COURT, LUDGATE HILL, E.C.

ENGINEERING, SURVEYING, ETC.

Humber's New Work on Water-Supply.

A COMPREHENSIVE TREATISE on the WATER-SUPPLY OF CITIES and TOWNS. By WILLIAM HUMBER, A-M. Inst. C.E., and M. Inst. M.E. Illustrated with 50 Double Plates, 1 Single Plate, Coloured Frontispiece, and upwards of 250 Woodcuts, and containing 400 pages of Text, Imp. 4to, 6l. 6s. elegantly and substantially half-bound in morocco.

List of Contents:—

I. Historical Sketch of some of the means that have been adopted for the Supply of Water to Cities and Towns.—II. Water and the Foreign Matter usually associated with it.—III. Rainfall and Evaporation.—IV. Springs and the water-bearing formations of various districts.—V. Measurement and Estimation of the Flow of Water.—VI. On the Selection of the Source of Supply.—VII. Wells.—VIII. Reservoirs.—IX. The Purification of Water.—X. Pumps.—XI. Pumping

Machinery.—XII. Conduits.—XIII. Distribution of Water.—XIV. Meters, Service Pipes, and House Fittings.—XV. The Law and Economy of Water Works.—XVI. Constant and Intermittent Supply.—XVII. Description of Plates.—Appendices, giving Tables of Rates of Supply, Velocities, &c. &c., together with Specifications of several Works illustrated, among which will be found:—Aberdeen, Bideford, Canterbury, Dundee, Halifax, Lambeth, Rotherham, Dublin, and others.

"The most systematic and valuable work upon water supply hitherto produced in English, or in any other language . . . Mr. Humber's work is characterised almost throughout by an exhaustiveness much more distinctive of French and German than of English technical treatises."—*Engineer*.

Humber's Great Work on Bridge Construction.

A COMPLETE and PRACTICAL TREATISE on CAST and WROUGHT-IRON BRIDGE CONSTRUCTION, including Iron Foundations. In Three Parts—Theoretical, Practical, and Descriptive. By WILLIAM HUMBER, A-M. Inst. C.E., and M. Inst. M.E. Third Edition, with 115 Double Plates. In 2 vols. imp. 4to, 6l. 16s. 6d. half-bound in morocco.

"A book—and particularly a large and costly treatise like Mr. Humber's—which has reached its third edition may certainly be said to have established its own reputation."—*Engineering*.

Humber's Modern Engineering.

A RECORD of the PROGRESS of MODERN ENGINEERING. First Series. Comprising Civil, Mechanical, Marine, Hydraulic, Railway, Bridge, and other Engineering Works, &c. By WILLIAM HUMBER, A.M. Inst. C.E., &c. Imp. 4to, with 36 Double Plates, drawn to a large scale, and Portrait of John Hawkshaw C.E., F.R.S., &c., and descriptive Letter-press, Specifications, &c. 3l. 3s. half morocco.

List of the Plates and Diagrams.

Victoria Station and Roof, L. B. & S. C. R. (8 plates); Southport Pier (2 plates); Victoria Station and Roof, L. C. & D. and G. W. R. (6 plates); Roof of Cremorne Music Hall; Bridge over G. N. Railway; Roof of Station, Dutch Rhenish Rail (2 plates); Bridge over the Thames, West London Extension Railway (5 plates); Armour Plates; Suspension Bridge, Thames (4 plates); The Allen Engine; Suspension Bridge, Avon (3 plates); Underground Railway (3 plates).

It will find favour with many who desire to preserve in a permanent form copies of the plans and specifications prepared for the guidance of the contractors for many important engineering works.—*Engineer.*

HUMBER'S RECORD OF MODERN ENGINEERING. Second Series. Imp. 4to, with 36 Double Plates, Portrait of Robert Stephenson, C.E., &c., and descriptive Letterpress, Specifications, &c. 3l. 3s. half morocco.

List of the Plates and Diagrams.

Birkenhead Docks, Low Water Basin (15 plates); Charing Cross Station Roof, C. C. Railway (3 plates); Digswell Viaduct, G. N. Railway; Robbery Wood Viaduct, G. N. Railway; Iron Permanent Way; Clydach Viaduct, Merthyr, Tredegar, and Abergavenny Railway; Ebbw Viaduct, Merthyr, Tredegar, and Abergavenny Railway; College Wood Viaduct, Cornwall Railway; Dublin Winter Palace Roof (3 plates); Bridge over the Thames, L. C. and D. Railway (6 plates); Albert Harbour, Greenock (4 plates).

HUMBER'S RECORD OF MODERN ENGINEERING. Third Series. Imp. 4to, with 40 Double Plates, Portrait of J. R. M'Clean, Esq., late Pres. Inst. C.E., and descriptive Letterpress, Specifications, &c. 3l. 3s. half morocco.

List of the Plates and Diagrams.

MAIN DRAINAGE, METROPOLIS.—*North Side.*—Map showing Interception of Sewers; Middle Level Sewer (2 plates); Outfall Sewer, Bridge over River Lea (3 plates); Outfall Sewer, Bridge over Marsh Lane, North Woolwich Railway, and Bow and Barking Railway Junction; Outfall Sewer, Bridge over Bow and Barking Railway (3 plates); Outfall Sewer, Bridge over East London Waterworks' Feeder (2 plates); Outfall Sewer, Reservoir (2 plates); Outfall Sewer, Tumbling Bay and Outlet; Outfall Sewer, Penstocks.

South Side.—Outfall Sewer, Bermondsey Branch (2 plates); Outfall Sewer, Reservoir and Outlet (4 plates); Outfall Sewer, Filth Hoist; Sections of Sewers (North and South Sides).

THAMES EMBANKMENT.—Section of River Wall; Steamboat Pier, Westminster (2 plates); Landing Stairs between Charing Cross and Waterloo Bridges; York Gate (2 plates); Overflow and Outlet at Savoy Street Sewer (3 plates); Steamboat Pier, Waterloo Bridge (3 plates); Junction of Sewers, Plans and Sections; Gullies, Plans and Sections; Rolling Stock; Granite and Iron Forts.

HUMBER'S RECORD OF MODERN ENGINEERING. Fourth Series. Imp. 4to, with 36 Double Plates, Portrait of John Fowler, Esq., late Pres. Inst. C.E., and descriptive Letterpress, Specifications, &c. 3l. 3s. half morocco.

List of the Plates and Diagrams.

Abbey Mills Pumping Station, Main Drainage, Metropolis (4 plates); Barrow Docks (5 plates); Manquis Viaduct, Santiago and Valparaiso Railway (2 plates); Adam's Locomotive, St. Helen's Canal Railway (2 plates); Cannon Street Station Roof, Charing Cross Railway (3 plates); Road Bridge over the River Moka (2 plates); Telegraphic Apparatus for Mesopotamia; Viaduct over the River Wye, Midland Railway (3 plates); St. German's Viaduct, Cornwall Railway (2 plates); Wrought-Iron Cylinder for Diving Bell; Millwall Docks (6 plates); Milroy's Patent Excavator, Metropolitan District Railway (6 plates); Harbours, Ports, and Breakwaters (3 plates).

Strains, Formulæ & Diagrams for Calculation of.

A HANDY BOOK for the CALCULATION of STRAINS in GIRDERS and SIMILAR STRUCTURES, and their STRENGTH; consisting of Formulæ and Corresponding Diagrams, with numerous Details for Practical Application, &c. By WILLIAM HUMBER, A-M. Inst. C.E., &c. Third Edition. With nearly 100 Woodcuts and 3 Plates, Crown 8vo, 7s. 6d. cloth.

"The arrangement of the matter in this little volume is as convenient as it well could be. . . . The system of employing diagrams as a substitute for complex computations is one justly coming into great favour, and in that respect Mr. Humber's volume is fully up to the times."—*Engineering*.

"The formulæ are neatly expressed, and the diagrams good."—*Athenæum*.

Strains.

THE STRAINS ON STRUCTURES OF IRONWORK; with Practical Remarks on Iron Construction. By F. W. SHEILDS, M. Inst. C.E. Second Edition, with 5 Plates. Royal 8vo, 5s. cloth.

"The student cannot find a better little book on this subject than that written by Mr. Shields."—*Engineer*.

Barlow on the Strength of Materials, enlarged.

A TREATISE ON THE STRENGTH OF MATERIALS, with Rules for application in Architecture, the Construction of Suspension Bridges, Railways, &c.; and an Appendix on the Power of Locomotive Engines, and the effect of Inclined Planes and Gradients. By PETER BARLOW, F.R.S. A New Edition, revised by his Sons, P. W. BARLOW, F.R.S., and W. H. BARLOW, F.R.S. The whole arranged and edited by W. HUMBER, A-M. Inst. C.E. 8vo, 400 pp., with 19 large Plates, 18s. cloth.

"The best book on the subject which has yet appeared. . . . We know of no work that so completely fulfils its mission."—*English Mechanic*.

"The standard treatise upon this particular subject."—*Engineer*.

Strength of Cast Iron, &c.

A PRACTICAL ESSAY on the STRENGTH of CAST IRON and OTHER METALS. By THOMAS TREDGOLD, C.E. Fifth Edition. To which are added, Experimental Researches on the Strength and other Properties of Cast Iron, by E. HODGKINSON, F.R.S. With 9 Engravings and numerous Woodcuts. 8vo, 12s. cloth. ** HODGKINSON'S RESEARCHES, separate, price 6s.

Hydraulics.

HYDRAULIC TABLES, CO-EFFICIENTS, and FORMULÆ for finding the Discharge of Water from Orifices, Notches, Weirs, Pipes, and Rivers. With New Formulæ, Tables, and General Information on Rain-fall, Catchment-Basins, Drainage, Sewerage, Water Supply for Towns and Mill Power. By JOHN NEVILLE, Civil Engineer, M.R.I.A. Third Edition, carefully revised, with considerable Additions. Numerous Illustrations. Cr. 8vo, 14s. cloth.

"Undoubtedly an exceedingly useful and elaborate compilation."—*Iron*.

"Alike valuable to students and engineers in practice."—*Mining Journal*.

River Engineering.

RIVER BARS: Notes on the Causes of their Formation, and on their Treatment by 'Induced Tidal Scour,' with a Description of the Successful Reduction by this Method of the Bar at Dublin. By I. J. MANN, Assistant Engineer to the Dublin Port and Docks Board. With Illustrations. Royal 8vo. 7s. 6d. cloth. *Just published.*

Levelling.

A TREATISE on the PRINCIPLES and PRACTICE of LEVELLING; showing its Application to Purposes of Railway and Civil Engineering, in the Construction of Roads; with Mr. TELFORD's Rules for the same. By FREDERICK W. SIMMS, F.G.S., M. Inst. C.E. Sixth Edition, very carefully revised, with the addition of Mr. LAW's Practical Examples for Setting out Railway Curves, and Mr. TRAUTWINE's Field Practice of Laying out Circular Curves. With 7 Plates and numerous Woodcuts. 8vo, 8s. 6d. cloth.

* * TRAUTWINE on Curves, separate, 5s.

"The text-book on levelling in most of our engineering schools and colleges."—*Engineer.*

Practical Tunnelling.

PRACTICAL TUNNELLING: Explaining in detail the Setting out of the Works, Shaft-sinking and Heading-Driving, Ranging the Lines and Levelling under Ground, Sub-Excavating, Timbering, and the Construction of the Brickwork of Tunnels with the amount of labour required for, and the Cost of, the various portions of the work. By F. W. SIMMS, M. Inst. C.E. Third Edition, Revised and Extended. By D. KINNEAR CLARK, M.I.C.E. Imp. 8vo, with 21 Folding Plates and numerous Wood Engravings, 30s. cloth.

"It has been regarded from the first as a text-book of the subject. . . . Mr. Clark has added immensely to the value of the book."—*Engineer.*

Steam.

STEAM AND THE STEAM ENGINE, Stationary and Portable. Being an Extension of Sewell's Treatise on Steam. By D. KINNEAR CLARK, M.I.C.E. Second Edition. 12mo, 4s. cloth.

Civil and Hydraulic Engineering.

CIVIL ENGINEERING. By HENRY LAW, M. Inst. C.E. Including a Treatise on Hydraulic Engineering, by GEORGE R. BURNELL, M.I.C.E. Sixth Edition, Revised, with large additions on Recent Practice in Civil Engineering, by D. KINNEAR CLARK, M. Inst. C.E. 12mo, 7s. 6d., cloth.

[Just published.]

Gas-Lighting.

COMMON SENSE FOR GAS-USERS: a Catechism of Gas-Lighting for Householders, Gasfitters, Millowners, Architects, Engineers, &c. By R. WILSON, C.E. 2nd Edition. Cr. 8vo, 2s. 6d.

Bridge Construction in Masonry, Timber, & Iron.

EXAMPLES OF BRIDGE AND VIADUCT CONSTRUCTION OF MASONRY, TIMBER, AND IRON; consisting of 46 Plates from the Contract Drawings or Admeasurement of select Works. By W. DAVIS HASKOLL, C.E. Second Edition, with the addition of 554 Estimates, and the Practice of Setting out Works, with 6 pages of Diagrams. Imp. 4to, 2l. 12s. 6d. half-morocco.

"A work of the present nature by a man of Mr. Haskoll's experience, must prove invaluable. The tables of estimates considerably enhance its value."—*Engineering.*

Earthwork.

EARTHWORK TABLES, showing the Contents in Cubic Yards of Embankments, Cuttings, &c., of Heights or Depths up to an average of 80 feet. By JOSEPH BROADBENT, C.E., and FRANCIS CAMPIN, C.E. Cr. 8vo, oblong, 5s. cloth.

Tramways and their Working.

TRAMWAYS: their CONSTRUCTION and WORKING. Containing a Comprehensive History of the System; an exhaustive Analysis of the Various Modes of Traction, including Horse Power, Steam, Heated Water, and Compressed Air; a Description of the varieties of Rolling Stock; and ample Details of Cost and Working Expenses, with Special Reference to the Tramways of the United Kingdom. By D. KINNEAR CLARK, M. I. C. E., Author of 'Railway Machinery,' &c., in one vol. 8vo, with numerous Illustrations and thirteen folding Plates, 18s. cloth.

"All interested in tramways must refer to it, as all railway engineers have turned to the author's work 'Railway Machinery.'"—*The Engineer*.

"Mr. Clark's book is indispensable for the students of the subject."—*The Builder*.

Pioneer Engineering.

PIONEER ENGINEERING. A Treatise on the Engineering Operations connected with the Settlement of Waste Lands in New Countries. By EDWARD DOBSON, A.I.C.E. With Plates and Wood Engravings. Revised Edition. 12mo, 5s. cloth.

"A workmanlike production, and one without possession of which no man should start to encounter the duties of a pioneer engineer."—*Athenæum*.

Steam Engine.

TEXT-BOOK ON THE STEAM ENGINE. By T. M. GOODEVE, M.A., Barrister-at-Law, Author of "The Principles of Mechanics," "The Elements of Mechanism," &c. Third Edition. With numerous Illustrations. Crown 8vo, 6s. cloth.

"Professor Goodeve has given us a treatise on the steam engine, which will bear comparison with anything written by Huxley or Maxwell, and we can award it no higher praise."—*Engineer*.

"Mr. Goodeve's text-book is a work of which every young engineer should possess himself."—*Mining Journal*.

Steam.

THE SAFE USE OF STEAM: containing Rules for Unprofessional Steam Users. By an ENGINEER. 4th Edition. Sewed, 6d.

"If steam-users would but learn this little book by heart, boiler explosions would become sensations by their rarity."—*English Mechanic*.

Mechanical Engineering.

MECHANICAL ENGINEERING: a Practical Treatise on. Comprising Metallurgy, Moulding, Casting, Forging, Tools, Workshop Machinery, Mechanical Manipulation, Manufacture of the Steam Engine, &c. By FRANCIS CAMPIN, C.E., Author of "Materials and Construction," &c. With Numerous Illustrations. 12mo, 3s. cloth boards. [Just published.

Works of Construction.

MATERIALS AND CONSTRUCTION: a Theoretical and Practical Treatise on the Strains, Designing, and Erection of Works of Construction. By FRANCIS CAMPIN, C.E., Author of "A Practical Treatise on Mechanical Engineering, &c." 12mo, 3s. 6d. cloth boards.

Iron Bridges, Girders, Roofs, &c.

A TREATISE ON THE APPLICATION OF IRON TO THE CONSTRUCTION OF BRIDGES, GIRDERS, ROOFS, AND OTHER WORKS. By F. CAMPIN, C.E. 12mo, 3s.

Oblique Arches.

A PRACTICAL TREATISE ON THE CONSTRUCTION of OBLIQUE ARCHES. By JOHN HART. 3rd Ed. Imp. 8vo, 8s. cloth.

Oblique Bridges.

A PRACTICAL and THEORETICAL ESSAY on OBLIQUE BRIDGES, with 13 large Plates. By the late GEO. WATSON BUCK, M.I.C.E. Third Edition, revised by his Son, J. H. WATSON BUCK, M.I.C.E.; and with the addition of Description to Diagrams for Facilitating the Construction of Oblique Bridges, by W. H. BARLOW, M.I.C.E. Royal 8vo, 12s. cloth.

"The standard text book for all engineers regarding skew arches is Mr. Buck's treatise and it would be impossible to consult a better."—*Engineer*.

Gas and Gasworks.

THE CONSTRUCTION OF GASWORKS AND THE MANUFACTURE AND DISTRIBUTION OF COAL-GAS. Originally written by SAMUEL HUGHES, C.E. Sixth Edition. Re-written and much Enlarged, by WILLIAM RICHARDS, C.E. With 72 Woodcuts. 12mo, 5s. cloth boards.

Waterworks for Cities and Towns.

WATERWORKS for the SUPPLY of CITIES and TOWNS, with a Description of the Principal Geological Formations of England as influencing Supplies of Water. By S. HUGHES. 4s. 6d. cloth.

Locomotive-Engine Driving.

LOCOMOTIVE-ENGINE DRIVING; a Practical Manual for Engineers in charge of Locomotive Engines. By MICHAEL REYNOLDS, M.S.E., formerly Locomotive Inspector L. B. and S. C. R. Fourth Edition, greatly enlarged. Comprising A KEY TO THE LOCOMOTIVE ENGINE. With Illustrations and Portrait of Author. Crown 8vo, 4s. 6d. cloth.

"Mr. Reynolds has supplied a want, and has supplied it well. We can confidently recommend the book not only to the practical driver, but to every one who takes an interest in the performance of locomotive engines."—*Engineer*.

The Engineer, Fireman, and Engine-Boy.

THE MODEL LOCOMOTIVE ENGINEER, FIREMAN, AND ENGINE-BOY; comprising a Historical Notice of the Pioneer Locomotive Engines and their Inventors, with a project for the establishment of Certificates of Qualification in the Running Service of Railways. By MICHAEL REYNOLDS, Author of "Locomotive-Engine Driving." Crown 8vo, 4s. 6d. cloth.

"From the technical knowledge of the author it will appeal to the railway man of to-day more forcibly than anything written by Dr. Smiles."—*English Mechanic*.

Stationary Engine Driving.

STATIONARY ENGINE DRIVING. A Practical Manual for Engineers in Charge of Stationary Engines. By MICHAEL REYNOLDS ("The Engine-Driver's Friend"), Author of "Locomotive-Engine Driving," &c. With Plates and Woodcuts, and Steel Portrait of James Watt. Crown 8vo, 4s. 6d. cloth.

Engine-Driving Life.

ENGINE-DRIVING LIFE; or Stirring Adventures and Incidents in the Lives of Locomotive Engine-Drivers. By MICHAEL REYNOLDS. Crown 8vo, 2s. cloth. [Just published.]

Construction of Iron Beams, Pillars, &c.

IRON AND HEAT ; exhibiting the Principles concerned in the construction of Iron Beams, Pillars, and Bridge Girders, and the Action of Heat in the Smelting Furnace. By J. ARMOUR, C.E. 3s.

Fire Engineering.

FIRES, FIRE-ENGINES, AND FIRE BRIGADES. With a History of Fire-Engines, their Construction, Use, and Management ; Remarks on Fire-Proof Buildings, and the Preservation of Life from Fire ; Statistics of the Fire Appliances in English Towns ; Foreign Fire Systems ; Hints on Fire Brigades, &c., &c. By CHARLES F. T. YOUNG, C.E. With numerous Illustrations, handsomely printed, 544 pp., demy 8vo, 1l. 4s. cloth.

"We can most heartily commend this book."—*Engineering*.

"Mr. Young's book on 'Fire Engines and Fire Brigades' contains a mass of information, which has been collected from a variety of sources. The subject is so intensely interesting and useful that it demands consideration."—*Building News*.

Trigonometrical Surveying.

AN OUTLINE OF THE METHOD OF CONDUCTING A TRIGONOMETRICAL SURVEY, for the Formation of Geographical and Topographical Maps and Plans, Military Reconnaissance, Levelling, &c., with the most useful Problems in Geodesy and Practical Astronomy. By LIEUT.-GEN. FROME, R.E., late Inspector-General of Fortifications. Fourth Edition, Enlarged, and partly Re-written. By CAPTAIN CHARLES WARREN, R.E. With 19 Plates and 115 Woodcuts, royal 8vo, 16s. cloth.

Tables of Curves.

TABLES OF TANGENTIAL ANGLES and MULTIPLES for setting out Curves from 5 to 200 Radius. By ALEXANDER BEAZELEY, M. Inst. C.E. Second Edition. Printed on 48 Cards, and sold in a cloth box, waistcoat-pocket size, 3s. 6d.

"Each table is printed on a small card, which, being placed on the theodolite, leaves the hands free to manipulate the instrument."—*Engineer*.

"Very handy ; a man may know that all his day's work must fall on two of these cards, which he puts into his own card-case, and leaves the rest behind."—

Engineering Fieldwork.

[*Athenæum*.]

THE PRACTICE OF ENGINEERING FIELDWORK, applied to Land and Hydraulic, Hydrographic, and Submarine Surveying and Levelling. Second Edition, revised, with considerable additions, and a Supplement on WATERWORKS, SEWERS, SEWAGE, and IRRIGATION. By W. DAVIS HASKOLL, C.E. Numerous folding Plates. In 1 Vol., demy 8vo, 1l. 5s., cl. boards.

Large Tunnel Shafts.

THE CONSTRUCTION OF LARGE TUNNEL SHAFTS. A Practical and Theoretical Essay. By J. H. WATSON BUCK, M. Inst. C.E., Resident Engineer, London and North-Western Railway. Illustrated with Folding Plates. Royal 8vo, 12s. cloth.

"Many of the methods given are of extreme practical value to the mason, and the observations on the form of arch, the rules for ordering the stone, and the construction of the templates, will be found of considerable use. We commend the book to the engineering profession, and to all who have to build similar shafts."—*Building News*.

"Will be regarded by civil engineers as of the utmost value, and calculated to save much time and obviate many mistakes."—*Colliery Guardian*.

Survey Practice.

AID TO SURVEY PRACTICE: for Reference in Surveying, Levelling, Setting-out and in Route Surveys of Travellers by Land and Sea. With Tables, Illustrations, and Records. By **LOWIS D'A. JACKSON, A-M.I.C.E.** Author of "Hydraulic Manual and Statistics," &c. Large crown, 8vo, 12s. 6d., cloth.

"Mr. Jackson has produced a valuable *vade-mecum* for the surveyor. We can recommend this book as containing an admirable supplement to the teaching of the accomplished surveyor."—*Athenaeum*.

"A general text book was wanted, and we are able to speak with confidence of Mr. Jackson's treatise. . . . We cannot recommend to the student who knows something of the mathematical principles of the subject a better course than to fortify his practice in the field under a competent surveyor with a study of Mr. Jackson's useful manual. The field records illustrate every kind of survey, and will be found an essential aid to the student."—*Building News*.

"The author brings to his work a fortunate union of theory and practical experience which, aided by a clear and lucid style of writing, renders the book both a very useful one and very agreeable to read."—*Builder*.

Sanitary Work.

SANITARY WORK IN THE SMALLER TOWNS AND IN VILLAGES. Comprising:—1. Some of the more Common Forms of Nuisance and their Remedies; 2. Drainage; 3. Water Supply. By **CHAS. SLAGG, Assoc. Inst. C.E.** Crown 8vo, 3s. cloth.

"A very useful book, and may be safely recommended. The author has had practical experience in the works of which he treats."—*Builder*.

Locomotives.

LOCOMOTIVE ENGINES, A Rudimentary Treatise on. Comprising an Historical Sketch and Description of the Locomotive Engine. By **G. D. DEMPSEY, C.E.** With large additions treating of the MODERN LOCOMOTIVE, by **D. KINNEAR CLARK, C.E., M.I.C.E.**, Author of "Tramways, their Construction and Working," &c., &c. With numerous Illustrations. 12mo. 3s. 6d. cloth boards.

"The student cannot fail to profit largely by adopting this as his preliminary text-book."—*Iron and Coal Trades Review*.

"Seems a model of what an elementary technical book should be."—*Academy*.

Fuels and their Economy.

FUEL, its Combustion and Economy; consisting of an Abridgment of "A Treatise on the Combustion of Coal and the Prevention of Smoke." By **C. W. WILLIAMS, A.I.C.E.** With extensive additions on Recent Practice in the Combustion and Economy of Fuel—Coal, Coke, Wood, Peat, Petroleum, &c.; by **D. KINNEAR CLARK, C.E., M.I.C.E.** Second Edition, revised. With numerous Illustrations. 12mo. 4s. cloth boards.

"Students should buy the book and read it, as one of the most complete and satisfactory treatises on the combustion and economy of fuel to be had."—*Engineer*.

Roads and Streets.

THE CONSTRUCTION OF ROADS AND STREETS. In Two Parts. I. The Art of Constructing Common Roads. By **HENRY LAW, C.E.** Revised and Condensed. II. Recent Practice in the Construction of Roads and Streets: including Pavements of Stone, Wood, and Asphalte. By **D. KINNEAR CLARK, C.E., M.I.C.E.** Second Edit., revised. 12mo, 5s. cloth.

"A book which every borough surveyor and engineer must possess, and which will be of considerable service to architects, builders, and property owners generally."—*Building News*.

Sewing Machine (The).

SEWING MACHINERY; being a Practical Manual of the Sewing Machine, comprising its History and Details of its Construction, with full Technical Directions for the Adjusting of Sewing Machines. By J. W. URQUHART, Author of "Electro Plating: a Practical Manual;" "Electric Light: its Production and Use." With Numerous Illustrations. 12mo, 2s. 6d. cloth boards.

Field-Book for Engineers.

THE ENGINEER'S, MINING SURVEYOR'S, and CONTRACTOR'S FIELD-BOOK. By W. DAVIS HASKOLL, C.E. Consisting of a Series of Tables, with Rules, Explanations of Systems, and Use of Theodolite for Traverse Surveying and Plotting the Work with minute accuracy by means of Straight Edge and Set Square only; Levelling with the Theodolite, Casting out and Reducing Levels to Datum, and Plotting Sections in the ordinary manner; Setting out Curves with the Theodolite by Tangential Angles and Multiples with Right and Left-hand Readings of the Instrument; Setting out Curves without Theodolite on the System of Tangential Angles by Sets of Tangents and Offsets; and Earthwork Tables to 80 feet deep, calculated for every 6 inches in depth. With numerous Woodcuts. 4th Edition, enlarged. Cr. 8vo. 12s. cloth.

"The book is very handy, and the author might have added that the separate tables of sines and tangents to every minute will make it useful for many other purposes, the genuine traverse tables existing all the same."—*Athenæum*.

"Cannot fail, from its portability and utility, to be extensively patronised by the engineering profession."—*Mining Journal*.

Earthwork, Measurement and Calculation of.

A MANUAL on EARTHWORK. By ALEX. J. S. GRAHAM, C.E., Resident Engineer, Forest of Dean Central Railway. With numerous Diagrams. 18mo, 2s. 6d. cloth.

"As a really handy book for reference, we know of no work equal to it; and the railway engineers and others employed in the measurement and calculation of earthwork will find a great amount of practical information very admirably arranged, and available for general or rough estimates, as well as for the more exact calculations required in the engineers' contractor's offices."—*Artisan*.

Drawing for Engineers, &c.

THE WORKMAN'S MANUAL OF ENGINEERING DRAWING. By JOHN MAXTON, Instructor in Engineering Drawing, Royal Naval College, Greenwich, formerly of R. S. N. A., South Kensington. Fourth Edition, carefully revised. With upwards of 300 Plates and Diagrams. 12mo, cloth, strongly bound, 4s.

"A copy of it should be kept for reference in every drawing office."—*Engineering*.

"Indispensable for teachers of engineering drawing."—*Mechanics' Magazine*.

Weale's Dictionary of Terms.

A DICTIONARY of TERMS used in ARCHITECTURE, BUILDING, ENGINEERING, MINING, METALLURGY, ARCHÆOLOGY, the FINE ARTS, &c. By JOHN WEALE. Fifth Edition, revised by ROBERT HUNT, F.R.S., Keeper of Mining Records, Editor of "Ure's Dictionary of Arts." 12mo, 6s. cl. bds.

"The best small technological dictionary in the language."—*Architect*.

"The absolute accuracy of a work of this character can only be judged of after extensive consultation, and from our examination it appears very correct and very complete."—*Mining Journal*.

MINING, METALLURGY, ETC.

Metalliferous Minerals and Mining.

A TREATISE ON METALLIFEROUS MINERALS AND MINING. By D. C. DAVIES, F.G.S., author of "A Treatise on Slate and Slate Quarrying." With numerous wood engravings. Second Edition, revised. Cr. 8vo. 12s. 6d. cloth.

"Without question, the most exhaustive and the most practically useful work we have seen; the amount of information given is enormous, and it is given concisely and intelligibly."—*Mining Journal*.

"The volume is one which no student of mineralogy should be without."—*Colliery Guardian*.

"The author has gathered together from all available sources a vast amount of really useful information. As a history of the present state of mining throughout the world this book has a real value, and it supplies an actual want, for no such information has hitherto been brought together within such limited space."—*Athenæum*.

Slate and Slate Quarrying.

A TREATISE ON SLATE AND SLATE QUARRYING, Scientific, Practical, and Commercial. By D. C. DAVIES, F.G.S., Mining Engineer, &c. With numerous Illustrations and Folding Plates. Second Edition, carefully revised. 12mo, 3s. 6d. cloth boards.

"Mr. Davies has written a useful and practical hand-book on an important industry, with all the conditions and details of which he appears familiar."—*Engineering*.

"The work is illustrated by actual practice, and is unusually thorough and lucid.

Mr. Davies has completed his work with industry and skill."—*Builder*.

Metallurgy of Iron.

A TREATISE ON THE METALLURGY OF IRON: containing Outlines of the History of Iron Manufacture, Methods of Assay, and Analyses of Iron Ores, Processes of Manufacture of Iron and Steel, &c. By H. BAUERMAN, F.G.S., Associate of the Royal School of Mines. With numerous Illustrations. Fourth Edition, revised and much enlarged. 12mo, cloth boards, 5s.

"Has the merit of brevity and conciseness, as to less important points, while all material matters are very fully and thoroughly entered into."—*Standard*.

Manual of Mining Tools.

MINING TOOLS. For the use of Mine Managers, Agents, Mining Students, &c. By WILLIAM MORGANS, Lecturer on Practical Mining at the Bristol School of Mines. Volume of Text. 12mo, 3s. With an Atlas of Plates, containing 235 Illustrations. 4to, 6s. Together, 9s. cloth boards.

"Students in the Science of Mining, and Overmen, Captains, Managers, and Viewers may gain practical knowledge and useful hints by the study of Mr. Morgans' Manual."—*Colliery Guardian*.

Mining, Surveying and Valuing.

THE MINERAL SURVEYOR AND VALUER'S COMPLETE GUIDE, comprising a Treatise on Improved Mining Surveying, with new Traverse Tables; and Descriptions of Improved Instruments; also an Exposition of the Correct Principles of Laying out and Valuing Home and Foreign Iron and Coal Mineral Properties. By WILLIAM LINTERN, Mining and Civil Engineer. With four Plates of Diagrams, Plans, &c., 12mo, 4s. cloth.

"Contains much valuable information given in a small compass, and which, as far as we have tested it, is thoroughly trustworthy."—*Iron and Coal Trades Review*.

** The above, bound with THOMAN'S TABLES. (See page 20.) Price 7s. 6d. cloth.

Coal and Coal Mining.

COAL AND COAL MINING: a Rudimentary Treatise on. By WARINGTON W. SMYTH, M.A., F.R.S., &c., Chief Inspector of the Mines of the Crown. Fifth edition, revised and corrected. 12mo, with numerous Illustrations, 4s. cloth boards.

"Every portion of the volume appears to have been prepared with much care, and as an outline is given of every known coal-field in this and other countries, as well as of the two principal methods of working, the book will doubtless interest a very large number of readers."—*Mining Journal*.

Underground Pumping Machinery.

MINE DRAINAGE; being a Complete and Practical Treatise on Direct-Acting Underground Steam Pumping Machinery, with a Description of a large number of the best known Engines, their General Utility and the Special Sphere of their Action, the Mode of their Application, and their merits compared with other forms of Pumping Machinery. By STEPHEN MICHELL, Joint-Author of "The Cornish System of Mine Drainage." 8vo, 15s. cloth. [*Just published*].

NAVAL ARCHITECTURE, NAVIGATION, ETC.

Pocket Book for Naval Architects & Shipbuilders.

THE NAVAL ARCHITECT'S AND SHIPBUILDER'S POCKET BOOK OF FORMULÆ, RULES, AND TABLES AND MARINE ENGINEER'S AND SURVEYOR'S HANDY BOOK OF REFERENCE. By CLEMENT MACKROW, M. Inst. N. A., Naval Draughtsman. With numerous Diagrams. Fcap., 12s. 6d., strongly bound in leather.

"Should be used by all who are engaged in the construction or design of vessels."—*Engineer*.

"There is scarcely a subject on which a naval architect or shipbuilder can require to refresh his memory which will not be found within the covers of Mr. Mackrow's book."—*English Mechanic*.

"Mr. Mackrow has compressed an extraordinary amount of information into this useful volume."—*Athenæum*.

Grantham's Iron Ship-Building.

ON IRON SHIP-BUILDING; with Practical Examples and Details. Fifth Edition. Imp. 4to, boards, enlarged from 24 to 40 Plates (21 quite new), including the latest Examples. Together with separate Text, also considerably enlarged, 12mo, cloth limp. By JOHN GRANTHAM, M. Inst. C.E., &c. 2l. 2s. complete.

"Mr. Grantham's work is of great interest. It will, we are confident, command an extensive circulation among shipbuilders in general. By order of the Board of Admiralty, the work will form the text-book on which the examination in iron ship-building of candidates for promotion in the dockyards will be mainly based."—*Engineering*.

Pocket-Book for Marine Engineers.

A POCKET-BOOK OF USEFUL TABLES AND FORMULÆ FOR MARINE ENGINEERS. By FRANK PROCTOR, A.I.N.A. Second Edition, revised and enlarged. Royal 32mo, leather, gilt edges, with strap, 4s.

"A most useful companion to all marine engineers."—*United Service Gazette*.

"Scarcely anything required by a naval engineer appears to have been forgotten."—*Iron*.

Light-Houses.

EUROPEAN LIGHT-HOUSE SYSTEMS ; being a Report of a Tour of Inspection made in 1873. By Major GEORGE H. ELLIOT, Corps of Engineers, U.S.A. Illustrated by 51 Engravings and 31 Woodcuts in the Text. 8vo, 21s. cloth.

Surveying (Land and Marine).

LAND AND MARINE SURVEYING, in Reference to the Preparation of Plans for Roads and Railways, Canals, Rivers, Towns' Water Supplies, Docks and Harbours ; with Description and Use of Surveying Instruments. By W. DAVIS HASKOLL, C.E. With 14 folding Plates, and numerous Woodcuts. 8vo, 12s. 6d. cloth.

"A most useful and well arranged book for the aid of a student."—*Builder*.

"Of the utmost practical utility, and may be safely recommended to all students who aspire to become clean and expert surveyors."—*Mining Journal*.

Storms.

STORMS : their Nature, Classification, and Laws, with the Means of Predicting them by their Embodiments, the Clouds. By WILLIAM BLASIUS. Crown 8vo, 10s. 6d. cloth boards.

Rudimentary Navigation.

THE SAILOR'S SEA-BOOK : a Rudimentary Treatise on Navigation. By JAMES GREENWOOD, B.A. New and enlarged edition. By W. H. ROSSER. 12mo, 3s. cloth boards.

Mathematical and Nautical Tables.

MATHEMATICAL TABLES, for Trigonometrical, Astronomical, and Nautical Calculations ; to which is prefixed a Treatise on Logarithms. By HENRY LAW, C.E. Together with a Series of Tables for Navigation and Nautical Astronomy. By J. R. YOUNG, formerly Professor of Mathematics in Belfast College. New Edition. 12mo, 4s. cloth boards.

Navigation (Practical), with Tables.

PRACTICAL NAVIGATION : consisting of the Sailor's Sea-Book, by JAMES GREENWOOD and W. H. ROSSER ; together with the requisite Mathematical and Nautical Tables for the Working of the Problems. By HENRY LAW, C.E., and Professor J. R. YOUNG. Illustrated with numerous Wood Engravings and Coloured Plates. 12mo, 7s. strongly half bound in leather.

WEALE'S RUDIMENTARY SERIES.

The following books in Naval Architecture, etc., are published in the above series.

- MASTING, MAST-MAKING, AND RIGGING OF SHIPS. By ROBERT KIPPING, N.A. Fourteenth Edition. 12mo, 2s. 6d. cloth.
 SAILS AND SAIL-MAKING. Tenth Edition, enlarged. By ROBERT KIPPING, N.A. Illustrated. 12mo, 3s. cloth boards.
 NAVAL ARCHITECTURE. By JAMES PEAKE. Fourth Edition, with Plates and Diagrams. 12mo, 4s. cloth boards.
 MARINE ENGINES, AND STEAM VESSELS. By ROBERT MURRAY, C.E. Seventh Edition. 12mo, 3s. 6d. cloth boards.

ARCHITECTURE, BUILDING, ETC.

Construction.

THE SCIENCE of BUILDING: An Elementary Treatise on the Principles of Construction. By E. WYNDHAM TARN, M.A., Architect. With 47 Wood Engravings. Demy 8vo, 8s. 6d. cloth.

"A very valuable book, which we strongly recommend to all students."—*Builder*.

"No architectural student should be without this hand-book."—*Architect*.

Villa Architecture.

A HANDY BOOK of VILLA ARCHITECTURE; being a Series of Designs for Villa Residences in various Styles. With Detailed Specifications and Estimates. By C. WICKES, Architect, Author of "The Spires and Towers of the Mediæval Churches of England," &c. 31 Plates, 4to, half morocco, gilt edges, 1l. 1s.

* Also an Enlarged edition of the above. 61 Plates, with Detailed Specifications, Estimates, &c. 2l. 2s. half morocco.

"The whole of the designs bear evidence of their being the work of an artistic architect, and they will prove very valuable and suggestive."—*Building News*.

Useful Text-Book for Architects.

THE ARCHITECT'S GUIDE: Being a Text-book of Useful Information for Architects, Engineers, Surveyors, Contractors. Clerks of Works, &c. By FREDERICK ROGERS. Author of "Specifications for Practical Architecture," &c. Cr. 8vo, 6s. cloth.

"As a text-book of useful information for architects, engineers, surveyors, &c., it would be hard to find a handier or more complete little volume."—*Standard*.

Taylor and Cresy's Rome.

THE ARCHITECTURAL ANTIQUITIES OF ROME. By the late G. L. TAYLOR, Esq., F.S.A., and EDWARD CRESY, Esq. New Edition, thoroughly revised, and supplemented under the editorial care of the Rev. ALEXANDER TAYLOR, M.A. (son of the late G. L. Taylor, Esq.), Chaplain of Gray's Inn. This is the only book which gives on a large scale, and with the precision of architectural measurement, the principal Monuments of Ancient Rome in plan, elevation, and detail. Large folio, with 130 Plates, half-bound, 3l. 3s.

* * * Originally published in two volumes, folio, at 18l. 18s.

Vitruvius' Architecture.

THE ARCHITECTURE OF MARCUS VITRUVIUS POLLIO. Translated by JOSEPH GWILT, F.S.A., F.R.A.S. Numerous Plates. 12mo, cloth limp, 5s.

The Young Architect's Book.

HINTS TO YOUNG ARCHITECTS. By GEORGE WIGHTWICK, Architect. New Edition, revised and enlarged. By G. HUSKISSON GUILLAUME, Architect. 12mo, cloth boards, 4s.

"Will be found an acquisition to pupils, and a copy ought to be considered as necessary a purchase as a box of instruments."—*Architect*.

"A large amount of information, which young architects will do well to acquire, if they wish to succeed in the everyday work of their profession."—*English Mechanic*.

Drawing for Builders and Students.

PRACTICAL RULES ON DRAWING for the OPERATIVE BUILDER and YOUNG STUDENT in ARCHITECTURE. By GEORGE PYNE. With 14 Plates, 4to, 7s. 6d. boards.

The House-Owner's Estimator.

THE HOUSE-OWNER'S ESTIMATOR; or, What will it Cost to Build, Alter, or Repair? A Price-Book adapted to the Use of Unprofessional People as well as for the Architectural Surveyor and Builder. By the late JAMES D. SIMON, A.R.I.B.A. Edited and Revised by FRANCIS T. W. MILLER, A.R.I.B.A., Surveyor. Third Edition, carefully Revised. Crown 8vo, 3s. 6d., cloth.

[First published.

"In two years it will repay its cost a hundred times over."—*Field*.

"A very handy book for those who want to know what a house will cost to build, alter, or repair."—*English Mechanic*.

Boiler and Factory Chimneys.

BOILER AND FACTORY CHIMNEYS; their Draught-power and Stability, with a chapter on Lightning Conductors. By ROBERT WILSON, C.E., Author of "Treatise on Steam Boilers," &c., &c. Crown 8vo, 3s. 6d. cloth.

Civil and Ecclesiastical Building.

A BOOK ON BUILDING, CIVIL AND ECCLESIASTICAL, Including CHURCH RESTORATION. By Sir EDMUND BECKETT, Bart., LL.D., Q.C., F.R.A.S., Chancellor and Vicar-General of York. Author of "Clocks and Watches and Bells," &c. Second Edition, 12mo, 5s. cloth boards.

"A book which is always amusing and nearly always instructive. Sir E. Beckett will be read for the raciness of his style. We are able very cordially to recommend all persons to read it for themselves. The style throughout is in the highest degree condensed and epigrammatic."—*Times*.

"We commend the book to the thoughtful consideration of all who are interested in the building art."—*Builder*.

Architecture, Ancient and Modern.

RUDIMENTARY ARCHITECTURE, Ancient and Modern. Consisting of VITRUVIUS, translated by JOSEPH GWILT, F.S.A., &c., with 23 fine copper plates; GRECIAN Architecture, by the EARL of ABERDEEN; the ORDERS of Architecture, by W. H. LEEDS, Esq.; The STYLES of Architecture of Various Countries, by T. TALBOT BURY; The PRINCIPLES of DESIGN in Architecture, by E. L. GARBETT. In one volume, half-bound (pp. 1,100), copiously illustrated, 12s.

* * Sold separately, in two vols., as follows—

ANCIENT ARCHITECTURE. Containing Gwilt's Vitruvius and Aberdeen's Grecian Architecture. Price 6s. half-bound.

N.B.—This is the only edition of VITRUVIUS procurable at a moderate price.

MODERN ARCHITECTURE. Containing the Orders, by Leeds; The Styles, by Bury; and Design, by Garbett. 6s. half-bound.

House Painting.

HOUSE PAINTING, GRAINING, MARBLING, AND SIGN WRITING: a Practical Manual of. With 9 Coloured Plates of Woods and Marbles, and nearly 150 Wood Engravings. By ELLIS A. DAVIDSON, Author of "Building Construction," &c. Third Edition, carefully revised. 12mo, 6s. cloth boards.

"Contains a mass of information of use to the amateur and of value to the practical man."—*English Mechanic*.

Plumbing.

PLUMBING; a Text-book to the Practice of the Art or Craft of the Plumber. With chapters upon House-drainage, embodying the latest Improvements. By W. P. BUCHAN, Sanitary Engineer. Second Edition, enlarged, with 300 illustrations, 12mo. 4s. cloth.

"The chapters on house-drainage may be usefully consulted, not only by plumbers, but also by engineers and all engaged or interested in house-building."—*Iron*.

Handbook of Specifications.

THE HANDBOOK OF SPECIFICATIONS; or, Practical Guide to the Architect, Engineer, Surveyor, and Builder, in drawing up Specifications and Contracts for Works and Constructions. Illustrated by Precedents of Buildings actually executed by eminent Architects and Engineers. By Professor THOMAS L. DONALDSON, M.I.B.A. New Edition, in One large volume, 8vo, with upwards of 1000 pages of text, and 33 Plates, cloth, 1l. 11s. 6d.

"In this work forty-four specifications of executed works are given. . . . Donaldson's Handbook of Specifications must be bought by all architects."—*Builder*.

Specifications for Practical Architecture.

SPECIFICATIONS FOR PRACTICAL ARCHITECTURE: A Guide to the Architect, Engineer, Surveyor, and Builder; with an Essay on the Structure and Science of Modern Buildings. By FREDERICK ROGERS, Architect. 8vo, 15s. cloth.

* * A volume of specifications of a practical character being greatly required, and the old standard work of Alfred Bartholomew being out of print, the author, on the basis of that work, has produced the above.—*Extract from Preface*.

Designing, Measuring, and Valuing.

THE STUDENT'S GUIDE to the PRACTICE of MEASURING and VALUING ARTIFICERS' WORKS; containing Directions for taking Dimensions, Abstracting the same, and bringing the Quantities into Bill, with Tables of Constants, and copious Memoranda for the Valuation of Labour and Materials in the respective Trades of Bricklayer and Slater, Carpenter and Joiner, Painter and Glazier, Paperhanger, &c. With 43 Plates and Woodcuts. Originally edited by EDWARD DOBSON, Architect. New Edition, re-written, with Additions on Mensuration and Construction, and useful Tables for facilitating Calculations and Measurements. By E. WYNDHAM TARN, M.A., 8vo, 10s. 6d. cloth.

"Well fulfils the promise of its title-page. Mr. Tarn's additions and revisions have much increased the usefulness of the work."—*Engineering*.

Beaton's Pocket Estimator.

THE POCKET ESTIMATOR FOR THE BUILDING TRADES, being an easy method of estimating the various parts of a Building collectively, more especially applied to Carpenters' and Joiners' work, priced according to the present value of material and labour. By A. C. BEATON, Author of "Quantities and Measurements." Second Edition. Waistcoat-pocket size. 1s. 6d.

Beaton's Builders' and Surveyors' Technical Guide.

THE POCKET TECHNICAL GUIDE AND MEASURER FOR BUILDERS AND SURVEYORS: containing a Complete Explanation of the Terms used in Building Construction, Memoranda for Reference, Technical Directions for Measuring Work in all the Building Trades, &c. By A. C. BEATON. 1s. 6d.

Builder's and Contractor's Price Book.

LOCKWOOD & CO.'S BUILDER'S AND CONTRACTOR'S PRICE BOOK, containing the latest prices of all kinds of Builders' Materials and Labour, and of all Trades connected with Building, &c., &c. The whole revised and edited by F. T. W. MILLER, A.R.I.B.A. Fcap. half-bound, 4s.

CARPENTRY, TIMBER, ETC.

Tredgold's Carpentry, new and cheaper Edition.

THE ELEMENTARY PRINCIPLES OF CARPENTRY : a Treatise on the Pressure and Equilibrium of Timber Framing, the Resistance of Timber, and the Construction of Floors, Arches, Bridges, Roofs, Uniting Iron and Stone with Timber, &c. To which is added an Essay on the Nature and Properties of Timber, &c., with Descriptions of the Kinds of Wood used in Building ; also numerous Tables of the Scantlings of Timber for different purposes, the Specific Gravities of Materials, &c. By THOMAS TREDGOLD, C.E. Edited by PETER BARLOW, F.R.S. Fifth Edition, corrected and enlarged. With 64 Plates (11 of which now first appear in this edition), Portrait of the Author, and several Woodcuts. In 1 vol., 4to, published at 2l. 2s., reduced to 1l. 5s. cloth.

"Ought to be in every architect's and every builder's library, and those who do not already possess it ought to avail themselves of the new issue."—*Builder*.

"A work whose monumental excellence must commend it wherever skilful carpentry is concerned. The Author's principles are rather confirmed than impaired by time. The additional plates are of great intrinsic value."—*Building News*.

Grandy's Timber Tables.

THE TIMBER IMPORTER'S, TIMBER MERCHANT'S, and BUILDER'S STANDARD GUIDE. By RICHARD E. GRANDY. Comprising :—An Analysis of Deal Standards, Home and Foreign, with comparative Values and Tabular Arrangements for Fixing Nett Landed Cost on Baltic and North American Deals, including all intermediate Expenses, Freight, Insurance, &c., &c. ; together with Copious Information for the Retailer and Builder. 2nd Edition. Carefully revised and corrected. 12mo, 3s. 6d. cloth.

"Everything it pretends to be : built up gradually, it leads one from a forest to a treenail, and throws in, as a makeweight, a host of material concerning bricks, columns, cisterns, &c.—all that the class to whom it appeals requires."—*English Mechanic*.

Timber Freight Book.

THE TIMBER IMPORTERS' AND SHIPOWNERS' FREIGHT BOOK : Being a Comprehensive Series of Tables for the Use of Timber Importers, Captains of Ships, Shipbrokers, Builders, and all Dealers in Wood whatsoever. By WILLIAM RICHARDSON, Timber Broker. Crown 8vo, 6s. cloth.

Tables for Packing-Case Makers.

PACKING-CASE TABLES ; showing the number of Superficial Feet in Boxes or Packing-Cases, from six inches square and upwards. By W. RICHARDSON. Oblong 4to, 3s. 6d. cloth.

"Will save much labour and calculation to packing-case makers and those who use packing-cases."—*Grocer*. "Invaluable labour-saving tables."—*Ironmonger*.

Horton's Measurer.

THE COMPLETE MEASURER; setting forth the Measurement of Boards, Glass, &c.; Unequal-sided, Square-sided, Octagonal-sided, Round Timber and Stone, and Standing Timber. With just allowances for the bark in the respective species of trees, and proper deductions for the waste in hewing the trees, &c.; also a Table showing the solidity of hewn or eight-sided timber, or of any octagonal-sided column. By RICHARD HORTON. Third edition, with considerable and valuable additions, 12mo, strongly bound in leather, 5s.

Horton's Underwood and Woodland Tables.

TABLES FOR PLANTING AND VALUING UNDERWOOD AND WOODLAND; also Lineal, Superficial, Cubical, and Decimal Tables, &c. By R. HORTON. 12mo, 2s. leather.

Nicholson's Carpenter's Guide.

THE CARPENTER'S NEW GUIDE; or, BOOK of LINES for CARPENTERS: comprising all the Elementary Principles essential for acquiring a knowledge of Carpentry. Founded on the late PETER NICHOLSON's standard work. A new Edition, revised by ARTHUR ASHPITEL, F.S.A., together with Practical Rules on Drawing, by GEORGE PYNE. With 74 Plates, 4to, 1l. 1s. cloth.

Dowsing's Timber Merchant's Companion.

THE TIMBER MERCHANT'S AND BUILDER'S COMPANION; containing New and Copious Tables of the Reduced Weight and Measurement of Deals and Battens, of all sizes, from One to a Thousand Pieces, also the relative Price that each size bears per Lineal Foot to any given Price per Petersburg Standard Hundred, &c., &c. Also a variety of other valuable information. By WILLIAM DOWSING, Timber Merchant. Third Edition, Revised. Crown 8vo, 3s. cloth.

"Everything is as concise and clear as it can possibly be made. There can be no doubt that every timber merchant and builder ought to possess it."—*Hull Advertiser*.

Practical Timber Merchant.

THE PRACTICAL TIMBER MERCHANT, being a Guide for the use of Building Contractors, Surveyors, Builders, &c., comprising useful Tables for all purposes connected with the Timber Trade, Essay on the Strength of Timber, Remarks on the Growth of Timber, &c. By W. RICHARDSON. Fcap. 8vo, 3s. 6d. cl.

Woodworking Machinery.

WOODWORKING MACHINERY; its Rise, Progress, and Construction. With Hints on the Management of Saw Mills and the Economical Conversion of Timber. Illustrated with Examples of Recent Designs by leading English, French, and American Engineers. By M. POWIS BALE, M.I.M.E. Large crown 8vo, 12s. 6d. cloth.

"Mr. Bale is evidently an expert on the subject, and he has collected so much information that his book is all-sufficient for builders and others engaged in the conversion of timber."—*Architect*.

"The most comprehensive compendium of wood-working machinery we have seen. The author is a thorough master of his subject."—*Building News*.

"It should be in the office of every wood-working factory."—*English Mechanic*.

MECHANICS, ETC.

Turning.

LATHE-WORK: a Practical Treatise on the Tools, Appliances, and Processes employed in the Art of Turning. By PAUL N. HASLUCK. With numerous Illustrations drawn by the Author. Crown 8vo, 5s. cloth. *[Just published.]*

"Evidently written from personal experience, and gives a large amount of just that sort of information which beginners at the lathe require."—*Builder.*

"Expounds the art and mystery of the turner in an informative fashion."—*Scotsman.*

"Mr. Hasluck's book will be a boon to amateurs."—*Architect.*

Mechanic's Workshop Companion.

THE OPERATIVE MECHANIC'S WORKSHOP COMPANION, and THE SCIENTIFIC GENTLEMAN'S PRACTICAL ASSISTANT. By W. TEMPLETON. 12th Edit., with Mechanical Tables for Operative Smiths, Millwrights, Engineers, &c.; and an Extensive Table of Powers and Roots, 12mo, 5s. bound.

"Admirably adapted to the wants of a very large class. It has met with great success in the engineering workshop, as we can testify; and there are a great many men who, in a great measure, owe their rise in life to this little work."—*Building News.*

Engineer's and Machinist's Assistant.

THE ENGINEER'S, MILLWRIGHT'S, and MACHINIST'S PRACTICAL ASSISTANT; comprising a Collection of Useful Tables, Rules, and Data. By WM. TEMPLETON. 18mo, 2s. 6d.

"A more suitable present to an apprentice to any of the mechanical trades could not possibly be made."—*Building News.*

Superficial Measurement.

THE TRADESMAN'S GUIDE TO SUPERFICIAL MEASUREMENT. Tables calculated from 1 to 200 inches in length, by 1 to 108 inches in breadth. For the use of Architects, Engineers, Timber Merchants, Builders, &c. By J. HAWKINGS. Fcp. 3s. 6d. cl.

The High-Pressure Steam Engine.

THE HIGH-PRESSURE STEAM ENGINE; an Exposition of its Comparative Merits, and an Essay towards an Improved System of Construction, adapted especially to secure Safety and Economy. By Dr. ERNST ALBAN. Translated from the German, with Notes, by Dr. POLE, F.R.S. 8vo, 16s. 6d. cloth.

Steam Boilers.

A TREATISE ON STEAM BOILERS: their Strength, Construction, and Economical Working. By R. WILSON, C.E. Fifth Edition. 12mo, 6s. cloth.

"The best work on boilers which has come under our notice."—*Engineering.*

"The best treatise that has ever been published on steam boilers."—*Engineer.*

Power in Motion.

POWER IN MOTION: Horse Power, Toothed Wheel Gearing, Long and Short Driving Bands, Angular Forces, &c. By JAMES ARMOUR, C.E. With 73 Diagrams. 12mo, 3s., cloth.

Mechanics.

THE HANDBOOK OF MECHANICS. By DIONYSIUS LARDNER, D.C.L. New Edition, Edited and considerably Enlarged, by BENJAMIN LOEWY, F.R.A.S., &c., post 8vo, 6s. cloth.

"Studiously popular . . . The application of the various branches of physics to the industrial arts is carefully shown."—*Mining Journal.*

MATHEMATICS, TABLES, ETC.

Gregory's Practical Mathematics.

MATHEMATICS for PRACTICAL MEN ; being a Common-place Book of Pure and Mixed Mathematics. Designed chiefly for the Use of Civil Engineers, Architects, and Surveyors. Part I. PURE MATHEMATICS—comprising Arithmetic, Algebra, Geometry, Mensuration, Trigonometry, Conic Sections, Properties of Curves. Part II. MIXED MATHEMATICS—comprising Mechanics in general, Statics, Dynamics, Hydrostatics, Hydrodynamics, Pneumatics, Mechanical Agents, Strength of Materials. With an Appendix of copious Logarithmic and other Tables. By OLINTHUS GREGORY, LL.D., F.R.A.S. Enlarged by HENRY LAW, C.E. 4th Edition, revised by Prof. J. R. YOUNG. With 13 Plates. 8vo, 1*l*. 1*s*. cloth.

"The engineer or architect will here find ready to his hand, rules for solving nearly every mathematical difficulty that may arise in his practice. The rules are in all cases explained by means of examples clearly worked out."—*Builder*.

The Metric System.

A SERIES OF METRIC TABLES, in which the British Standard Measures and Weights are compared with those of the Metric System at present in use on the Continent. By C. H. DOWLING, C.E. 2nd Edit., revised and enlarged. 8vo, 10*s*. 6*d*. cl.

"Their accuracy has been certified by Prof. Airy, Astronomer-Royal."—*Builder*.

Inwood's Tables, greatly enlarged and improved.

TABLES FOR THE PURCHASING OF ESTATES, Freehold, Copyhold, or Leasehold; Annuities, Advowsons, &c., and for the Renewing of Leases held under Cathedral Churches, Colleges, or other corporate bodies; for Terms of Years certain, and for Lives; also for Valuing Reversionary Estates, Deferred Annuities, Next Presentations, &c., together with Smart's Five Tables of Compound Interest, and an Extension of the same to Lower and Intermediate Rates. By WILLIAM INWOOD, Architect. The 21st edition, with considerable additions, and new and valuable Tables of Logarithms for the more Difficult Computations of the Interest of Money, Discount, Annuities, &c. By M. FÉDOR THOMAN. 12mo, 8*s*. cloth.

"Those interested in the purchase and sale of estates, and in the adjustment of compensation cases, as well as in transactions in annuities, life insurances, &c., will find the present edition of eminent service."—*Engineering*.

Geometry for the Architect, Engineer, &c.

PRACTICAL GEOMETRY, for the Architect, Engineer, and Mechanic. By E. W. TARN, M.A., Architect. Demy 8vo, 12*s*. 6*d*. cl.

Mathematical Instruments.

MATHEMATICAL INSTRUMENTS: Their Construction, Adjustment, Testing, and Use; comprising Drawing, Measuring, Optical, Surveying, and Astronomical Instruments. By J. F. HEATHER, M.A. Enlarged Edition. 12mo, 5*s*. cloth.

Weights, Measures, Moneys, &c.

MEASURES, WEIGHTS, and MONEYS of all NATIONS, and an Analysis of the Christian, Hebrew, and Mahometan Calendars. Entirely New Edition, Revised and Enlarged. By W. S. B. WOOLHOUSE, F.R.A.S. 12mo, 2*s*. 6*d*. cloth boards.

Compound Interest and Annuities.

THEORY of COMPOUND INTEREST and ANNUITIES ; with Tables of Logarithms for the more Difficult Computations of Interest, Discount, Annuities, &c., in all their Applications and Uses for Mercantile and State Purposes. By FÉDOR THOMAN, of the Société Crédit Mobilier, Paris. 3rd Edit., 12mo, 4s. 6d. cl.

"A very powerful work, and the Author has a very remarkable command of his subject."—*Professor A. de Morgan.*

Iron and Metal Trades' Calculator.

THE IRON AND METAL TRADES' COMPANION : Being a Calculator containing a Series of Tables upon a new and comprehensive plan for expeditiously ascertaining the value of any goods bought or sold by weight, from 1s. per cwt. to 112s. per cwt., and from one farthing per lb. to 1s. per lb. Each Table extends from one lb. to 100 tons. By T. DOWNIE. 396 pp., 9s., leather.

"A most useful set of tables, and will supply a want, for nothing like them before existed."—*Building News.*

Iron and Steel.

'IRON AND STEEL': a Work for the Forge, Foundry, Factory, and Office. Containing Information for Ironmasters and their Stocktakers ; Managers of Bar, Rail, Plate, and Sheet Rolling Mills ; Iron and Metal Founders ; Iron Ship and Bridge Builders ; Mechanical, Mining, and Consulting Engineers ; Architects, Builders, &c. By CHARLES HOARE, Author of 'The Slide Rule,' &c. Eighth Edition. With folding Scales of "Foreign Measures compared with the English Foot," and "fixed Scales of Squares, Cubes, and Roots, Areas, Decimal Equivalents, &c." Oblong, 32mo, 6s., leather, elastic-band.

"For comprehensiveness the book has not its equal."—*Iron.*

Comprehensive Weight Calculator.

THE WEIGHT CALCULATOR, being a Series of Tables upon a New and Comprehensive Plan, exhibiting at one Reference the exact Value of any Weight from 1lb. to 15 tons, at 300 Progressive Rates, from 1 Penny to 168 Shillings per cwt., and containing 186,000 Direct Answers, which, with their Combinations, consisting of a single addition (mostly to be performed at sight), will afford an aggregate of 10,266,000 Answers ; the whole being calculated and designed to ensure Correctness and promote Despatch. By HENRY HARBEN, Accountant, Sheffield. New Edition. Royal 8vo, 1l. 5s., strongly half-bound.

Comprehensive Discount Guide.

THE DISCOUNT GUIDE : comprising several Series of Tables for the use of Merchants, Manufacturers, Ironmongers, and others, by which may be ascertained the exact profit arising from any mode of using Discounts, either in the Purchase or Sale of Goods, and the method of either Altering a Rate of Discount, or Advancing a Price, so as to produce, by one operation, a sum that will realise any required profit after allowing one or more Discounts : to which are added Tables of Profit or Advance from $1\frac{1}{2}$ to 90 per cent., Tables of Discount from $1\frac{1}{2}$ to $98\frac{1}{2}$ per cent., and Tables of Commission, &c., from $\frac{1}{2}$ to 10 per cent. By HENRY HARBEN, Accountant. New Edition. Demy 8vo, 1l. 5s., half-bound.

SCIENCE AND ART.

The Construction of the Organ.

PRACTICAL ORGAN BUILDING. By W. E. DICKSON, M.A., Precentor of Ely Cathedral. Crown 8vo, 5s. cloth.

"In many respects the book is the best that has yet appeared on the subject. We cordially recommend it."—*English Mechanic*.

"Any practical amateur following the instructions here given might build an organ to his entire satisfaction."—*Leeds Mercury*.

Dentistry.

MECHANICAL DENTISTRY. A Practical Treatise on the Construction of the various kinds of Artificial Dentures. Comprising also Useful Formulæ, Tables, and Receipts for Gold Plate, Clasps, Solders, etc., etc. By CHARLES HUNTER. With numerous Wood Engravings. Crown 8vo, 7s. 6d. cloth.

"The work is very practical."—*Monthly Review of Dental Surgery*.

"An authoritative treatise We can strongly recommend Mr. Hunter's treatise to all students preparing for the profession of dentistry, as well as to every mechanical dentist."—*Dublin Journal of Medical Science*. [and Circular.

"The best book on the subject with which we are acquainted."—*Medical Press*.

Brewing.

A HANDBOOK FOR YOUNG BREWERS. By HERBERT EDWARDS WRIGHT, B.A. Crown 8vo, 3s. 6d. cloth.

"A thoroughly scientific treatise in popular language. It is evident that the author has mastered his subject in its scientific aspects."—*Morning Advertiser*.

"We would particularly recommend teachers of the art to place it in every pupil's hands, and we feel sure its perusal will be attended with advantage."—*Brewer*.

Gold and Gold-Working.

THE GOLDSMITH'S HANDBOOK: containing full instructions for the Alloying and Working of Gold. Including the Art of Alloying, Melting, Reducing, Colouring, Collecting and Refining. The processes of Manipulation, Recovery of Waste, Chemical and Physical Properties of Gold, with a new System of Mixing its Alloys; Solders, Enamels, and other useful Rules and Recipes, &c. By GEORGE E. GEE, Goldsmith and Silversmith. Second Edition, considerably enlarged. 12mo, 3s. 6d. cloth boards.

"The best work yet printed on its subject for a reasonable price."—*Jeweller*.

"We consider that the trade owes not a little to Mr. Gee, who has in two volumes compressed almost the whole of its literature, and we doubt not that many a young beginner will owe a part of his future success to a diligent study of the pages which are peculiarly well adapted to his use."—*Clerkenwell Press*.

"Essentially a practical manual, well adapted to the wants of amateurs and apprentices, containing trustworthy information that only a practical man can supply."—*English Mechanic*.

Silver and Silver Working.

THE SILVERSMITH'S HANDBOOK, containing full Instructions for the Alloying and Working of Silver, including the different modes of refining and melting the metal, its solders, the preparation of imitation alloys, &c. By GEORGE E. GEE, Jeweller, &c. 12mo, 3s. 6d. cloth boards.

"The chief merit of the work is its practical character. The workers in the trade will speedily discover its merits when they sit down to study it."—*English Mechanic*.

"This work forms a valuable sequel to the author's *Practical Goldworker*, and supplies a want long felt in the silver trade."—*Silversmith's Trade Journal*.

Electric Lighting.

ELECTRIC LIGHT : Its Production and Use, embodying plain Directions for the Working of Galvanic Batteries, Electric Lamps, and Dynamo-Electric Machines. By J. W. URQUHART, C. E., Author of "Electroplating : a Practical Handbook." Edited by F. C. WEBB, M.I.C.E., M.S.T.E. With 94 Illustrations. Crown 8vo, 7s. 6d. cloth.

"It is the only work at present available, which gives a general but concise history of the means [which have been adopted up to the present time in producing the electric light]."—*Metropolitan*.

"An important addition to the literature of the electric light. Students of the subject should not fail to read it."—*Colliery Guardian*.

Electroplating, &c.

ELECTROPLATING : A Practical Handbook. By J. W. URQUHART, C.E. Crown 8vo, 5s. cloth.

"A large amount of thoroughly practical information."—*Telegraphic Journal*.

"An excellent practical manual."—*Engineering*.

"The information given appears to be based on direct personal knowledge. . . . Its science is sound, and the style is always clear."—*Athenæum*.

"Any ordinarily intelligent person may become an adept in electro-deposition with a very little science indeed, and this is the book to show him or her the way."—*Builder*.

"The volume is without a rival in its particular sphere."—*Design and Work*.

Electrotyping, &c.

ELECTROTYPING : a Practical Manual on the Reproduction and Multiplication of Printing Surfaces and Works of Art by the Electro-deposition of Metals. By J. W. URQUHART, C.E. Crown 8vo, 5s. cloth. [Just published.]

"Will serve as a guide, not only to beginners in the art, but to those who still practise the old and imperfect methods of electrotyping."—*Iron*.

"The book throughout is entirely practical, is lucid and clear in style, and the minutest details are so stated that amateurs will find no difficulty whatever in following them out. We have no hesitation in recommending it as a reliable work."—*Paper and Printing Trades Journal*.

The Military Sciences.

AIDE-MÉMOIRE to the MILITARY SCIENCES. Framed from Contributions of Officers and others connected with the different Services. Originally edited by a Committee of the Corps of Royal Engineers. Second Edition, most carefully revised by an Officer of the Corps, with many additions ; containing nearly 350 Engravings and many hundred Woodcuts. 3 vols. royal 8vo, extra cloth boards, and lettered, 4l. 10s.

Field Fortification.

A TREATISE on FIELD FORTIFICATION, the ATTACK of FORTRESSES, MILITARY MINING, and RECONNOITRING. By Colonel I. S. MACAULAY, late Professor of Fortification in the R. M. A., Woolwich. Sixth Edition, crown 8vo, cloth, with separate Atlas of 12 Plates, 12s. complete.

Dye-Wares and Colours.

THE MANUAL of COLOURS and DYE-WARES : their Properties, Applications, Valuation, Impurities, and Sophistications. For the Use of Dyers, Printers, Drapers, Brokers, &c. By J. W. SLATER. Post 8vo, 7s. 6d. cloth.

The Alkali Trade—Sulphuric Acid, &c.

A MANUAL OF THE ALKALI TRADE, including the Manufacture of Sulphuric Acid, Sulphate of Soda, and Bleaching Powder. By JOHN LOMAS, Alkali Manufacturer, Newcastle-upon-Tyne and London. With 232 Illustrations and Working Drawings, and containing 386 pages of text. Super-royal 8vo, 2l 12s. 6d. cloth. [Just published.]

This work provides (1) a Complete Handbook for intending Alkali and Sulphuric Acid Manufacturers, and for those already in the field who desire to improve their plant, or to become practically acquainted with the latest processes and developments of the trade; (2) a Handy Volume which Manufacturers can put into the hands of their Managers and Foremen as a useful guide in their daily rounds of duty.

SYNOPSIS OF CONTENTS.

Chap. I. Choice of Site and General Plan of Works—II. Sulphuric Acid—III. Recovery of the Nitrogen Compounds, and Treatment of Small Pyrites—IV. The Salt Cake Process—V. Legislation upon the Noxious Vapours Question—VI. The Hargreaves' and Jones' Processes—VII. The Balling Process—VIII. Lixiviation and Salting Down—

IX. Carbonating or Finishing—X. Soda Crystals—XI. Refined Alkali—XII. Caustic Soda—XIII. Bi-carbonate of Soda—XIV. Bleaching Powder—XV. Utilisation of Tank Waste—XVI. General Remarks—Four Appendices, treating of Yields, Sulphuric Acid Calculations, Anemometers, and Foreign Legislation upon the Noxious Vapours Question.

"The author has given the fullest, most practical, and, to all concerned in the alkali trade, most valuable mass of information that, to our knowledge, has been published in any language."—*Engineer*.

"This book is written by a manufacturer for manufacturers. The working details of the most approved forms of apparatus are given, and these are accompanied by no less than 232 wood engravings, all of which may be used for the purposes of construction. Every step in the manufacture is very fully described in this manual, and each improvement explained. Everything which tends to introduce economy into the technical details of this trade receives the fullest attention. The book has been produced with great completeness."—*Athenæum*.

"The author is not one of those clever compilers who, on short notice, will 'read up' any conceivable subject, but a practical man in the best sense of the word. We find here not merely a sound and luminous explanation of the chemical principles of the trade, but a notice of numerous matters which have a most important bearing on the successful conduct of alkali works, but which are generally overlooked by even the most experienced technological authors. This most valuable book, which we trust will be generally appreciated, we must pronounce a credit alike to its author and to the enterprising firm who have undertaken its publication."—*Chemical Review*.

Chemical Analysis.

THE COMMERCIAL HANDBOOK of CHEMICAL ANALYSIS; or Practical Instructions for the determination of the Intrinsic or Commercial Value of Substances used in Manufactures, in Trades, and in the Arts. By A. NORMANDY, Author of "Practical Introduction to Rose's Chemistry," and Editor of Rose's "Treatise on Chemical Analysis." *New Edition*. Enlarged, and to a great extent re-written, by HENRY M. NOAD, Ph. D., F.R.S. With numerous Illustrations. Cr. 8vo, 12s. 6d. cloth.

"We recommend this book to the careful perusal of every one; it may be truly affirmed to be of universal interest, and we strongly recommend it to our readers as a guide, alike indispensable to the housewife as to the pharmaceutical practitioner."—*Medical Times*.

"Essential to the analysts appointed under the new Act. The most recent results are given, and the work is well edited and carefully written."—*Nature*.

Dr. Lardner's Museum of Science and Art.

THE MUSEUM OF SCIENCE AND ART. Edited by DIONYSIUS LARDNER, D.C.L., formerly Professor of Natural Philosophy and Astronomy in University College, London. With upwards of 1200 Engravings on Wood. In 6 Double Volumes. Price £1 1s., in a new and elegant cloth binding, or handsomely bound in half morocco, 31s. 6d.

OPINIONS OF THE PRESS.

"This series, besides affording popular but sound instruction on scientific subjects, with which the humblest man in the country ought to be acquainted, also undertakes that teaching of 'common things' which every well-wisher of his kind is anxious to promote. Many thousand copies of this serviceable publication have been printed, in the belief and hope that the desire for instruction and improvement widely prevails; and we have no fear that such enlightened faith will meet with disappointment."—*Times*.

"A cheap and interesting publication, alike informing and attractive. The papers combine subjects of importance and great scientific knowledge, considerable inductive powers, and a popular style of treatment."—*Spectator*.

"The 'Museum of Science and Art' is the most valuable contribution that has ever been made to the Scientific Instruction of every class of society."—*Sir David Brewster in the North British Review*.

"Whether we consider the liberality and beauty of the illustrations, the charm of the writing, or the durable interest of the matter, we must express our belief that there is hardly to be found among the new books, one that would be welcomed by people of so many ages and classes as a valuable present."—*Examiner*.

* * *Separate books formed from the above, suitable for Workmen's Libraries, Science Classes, &c.*

COMMON THINGS EXPLAINED. Containing Air, Earth, Fire, Water, Time, Man, the Eye, Locomotion, Colour, Clocks and Watches, &c. 233 Illustrations, cloth gilt, 5s.

THE MICROSCOPE. Containing Optical Images, Magnifying Glasses, Origin and Description of the Microscope, Microscopic Objects, the Solar Microscope, Microscopic Drawing and Engraving, &c. 147 Illustrations, cloth gilt, 2s.

POPULAR GEOLOGY. Containing Earthquakes and Volcanoes, the Crust of the Earth, etc. 201 Illustrations, cloth gilt, 2s. 6d.

POPULAR PHYSICS. Containing Magnitude and Minuteness, the Atmosphere, Meteoric Stones, Popular Fallacies, Weather Prognostics, the Thermometer, the Barometer, Sound, &c. 85 Illustrations, cloth gilt, 2s. 6d.

STEAM AND ITS USES. Including the Steam Engine, the Locomotive, and Steam Navigation. 89 Illustrations, cloth gilt, 2s.

POPULAR ASTRONOMY. Containing How to Observe the Heavens. The Earth, Sun, Moon, Planets. Light, Comets, Eclipses, Astronomical Influences, &c. 182 Illustrations, 4s. 6d.

THE BEE AND WHITE ANTS: Their Manners and Habits. With Illustrations of Animal Instinct and Intelligence. 135 Illustrations, cloth gilt, 2s.

THE ELECTRIC TELEGRAPH POPULARISED. To render intelligible to all who can Read, irrespective of any previous Scientific Acquirements, the various forms of Telegraphy in Actual Operation. 100 Illustrations, cloth gilt, 1s. 6d.

Dr. Lardner's Handbooks of Natural Philosophy.

. The following five volumes, though each is Complete in itself, and to be purchased separately, form A COMPLETE COURSE OF NATURAL PHILOSOPHY, and are intended for the general reader who desires to attain accurate knowledge of the various departments of Physical Science, without pursuing them according to the more profound methods of mathematical investigation. The style is studiously popular. It has been the author's aim to supply Manuals such as are required by the Student, the Engineer, the Artisan, and the superior classes in Schools.

THE HANDBOOK OF MECHANICS. Enlarged and almost rewritten by BENJAMIN LOEWY, F.R.A.S. With 378 Illustrations. Post 8vo, 6s. cloth.

"The perspicuity of the original has been retained, and chapters which had become obsolete, have been replaced by others of more modern character. The explanations throughout are studiously popular, and care has been taken to show the application of the various branches of physics to the industrial arts, and to the practical business of life."—*Mining Journal*.

THE HANDBOOK OF HYDROSTATICS and PNEUMATICS.

New Edition, Revised and Enlarged by BENJAMIN LOEWY, F.R.A.S. With 236 Illustrations. Post 8vo, 5s. cloth.

"For those who desire to attain an accurate knowledge of physical science without the profound methods of mathematical investigation, this work is not merely intended, but well adapted."—*Chemical News*.

THE HANDBOOK OF HEAT. Edited and almost entirely

Rewritten by BENJAMIN LOEWY, F.R.A.S., etc. 117 Illustrations. Post 8vo, 6s. cloth.

"The style is always clear and precise, and conveys instruction without leaving any cloudiness or lurking doubts behind."—*Engineering*.

THE HANDBOOK OF OPTICS. New Edition. Edited by

T. OLVER HARDING, B.A. 298 Illustrations. Post 8vo, 5s. cloth.

"Written by one of the ablest English scientific writers, beautifully and elaborately illustrated."—*Mechanics' Magazine*.

THE HANDBOOK OF ELECTRICITY, MAGNETISM, and

ACOUSTICS. New Edition. Edited by GEO. CAREY FOSTER, B.A., F.C.S. With 400 Illustrations. Post 8vo, 5s. cloth.

"The book could not have been entrusted to any one better calculated to preserve the terse and lucid style of Lardner, while correcting his errors and bringing up his work to the present state of scientific knowledge."—*Popular Science Review*.

Dr. Lardner's Handbook of Astronomy.

THE HANDBOOK OF ASTRONOMY. Forming a Com-

panion to the "Handbooks of Natural Philosophy." By DIONYSIUS LARDNER, D.C.L., formerly Professor of Natural Philosophy

and Astronomy in University College, London. Fourth Edition.

Revised and Edited by EDWIN DUNKIN, F.R.S., Royal Observa-

tory, Greenwich. With 38 Plates and upwards of 100 Woodcuts.

In 1 vol., small 8vo, 550 pages, 9s. 6d., cloth.

"Probably no other book contains the same amount of information in so compendious and well-arranged a form—certainly none at the price at which this is offered to the public."—*Athenæum*.

"We can do no other than pronounce this work a most valuable manual of astronomy, and we strongly recommend it to all who wish to acquire a general—but at the same time correct—acquaintance with this sublime science."—*Quarterly Journal of Science*.

Dr. Lardner's Handbook of Animal Physics.

THE HANDBOOK OF ANIMAL PHYSICS. By DR.

LARDNER. With 520 Illustrations. New edition, small 8vo,

cloth, 732 pages, 7s. 6d.

"We have no hesitation in cordially recommending it."—*Educational Times*.

Dr. Lardner's School Handbooks.

NATURAL PHILOSOPHY FOR SCHOOLS. By DR. LARDNER. 328 Illustrations. Sixth Edition. 1 vol. 3s. 6d. cloth.

"Conveys, in clear and precise terms, general notions of all the principal divisions of Physical Science."—*British Quarterly Review*.

ANIMAL PHYSIOLOGY FOR SCHOOLS. By DR. LARDNER. With 190 Illustrations. Second Edition. 1 vol. 3s. 6d. cloth.

"Clearly written, well arranged, and excellently illustrated."—*Gardeners' Chronicle*.

Dr. Lardner's Electric Telegraph.

THE ELECTRIC TELEGRAPH. By DR. LARDNER. New Edition. Revised and Re-written, by E. B. BRIGHT, F.R.A.S. 140 Illustrations. Small 8vo, 2s. 6d. cloth.

"One of the most readable books extant on the Electric Telegraph."—*Eng. Mechanic*.

Electricity.

A MANUAL of ELECTRICITY; including Galvanism, Magnetism, Diamagnetism, Electro-Dynamics, Magneto-Electricity, and the Electric Telegraph. By HENRY M. NOAD, Ph.D., F.C.S. Fourth Edition, with 500 Woodcuts. 8vo, 1l. 4s. cloth.

"The accounts given of electricity and galvanism are not only complete in a scientific sense, but, which is a rarer thing, are popular and interesting."—*Lancet*.

Text-Book of Electricity.

THE STUDENT'S TEXT-BOOK OF ELECTRICITY. By HENRY M. NOAD, Ph.D., F.R.S., F.C.S. New Edition, carefully Revised. With an Introduction and Additional Chapters by W. H. PREECE, M.I.C.E., Vice-President of the Society of Telegraph Engineers, &c. With 470 Illustrations. Crown 8vo, 12s. 6d. cloth.

"A reflex of the existing state of Electrical Science adapted for students."—W. H. PREECE, Esq., vide "Introduction."

"We can recommend Dr. Noad's book for clear style, great range of subject, a good index, and a plethora of woodcuts. Such collections as the present are indispensable."—*Athenæum*.

"An admirable text-book for every student—beginner or advanced—of electricity."—*Engineering*.

"Recommended to students as one of the best text-books on the subject that they can have. Mr. Preece appears to have introduced all the newest inventions in the shape of telegraphic, telephonic, and electric-lighting apparatus."—*English Mechanic*.

"The work contains everything that the student can require."—*Academy*.

"One of the best and most useful compendiums of any branch of science in our literature."—*Iron*.

"Under the editorial hand of Mr. Preece the late Dr. Noad's text-book of electricity has grown into an admirable handbook."—*Westminster Review*.

Carriage Building, &c.

COACH BUILDING: a Practical Treatise, Historical and Descriptive, containing full information of the various Trades and Processes involved, with Hints on the proper Keeping of Carriages, &c. With 57 Illustrations. By JAMES W. BURGESS. 12mo, 3s. cloth boards. [Just published.]

Geology and Genesis.

THE TWIN RECORDS OF CREATION; or, Geology and Genesis, their Perfect Harmony and Wonderful Concord. By GEORGE W. VICTOR LE VAUX. Fcap. 8vo, 5s. cloth.

"A valuable contribution to the evidences of revelation, and disposes very conclusively of the arguments of those who would set God's Works against God's Word. No real difficulty is shirked, and no sophistry is left unexposed."—*The Rock*.

Science and Scripture.

SCIENCE ELUCIDATIVE OF SCRIPTURE, AND NOT ANTAGONISTIC TO IT; being a Series of Essays on—1. Alleged Discrepancies; 2. The Theory of the Geologists and Figure of the Earth; 3. The Mosaic Cosmogony; 4. Miracles in general—Views of Hume and Powell; 5. The Miracle of Joshua—Views of Dr. Colenso: The Supernaturally Impossible; 6. The Age of the Fixed Stars, &c. By Prof. J. R. YOUNG. Fcap. 5s. cl.

Geology.

A CLASS-BOOK OF GEOLOGY: Consisting of "Physical Geology," which sets forth the Leading Principles of the Science; and "Historical Geology," which treats of the Mineral and Organic Conditions of the Earth at each successive epoch, especial reference being made to the British Series of Rocks. By RALPH TATE. With more than 250 Illustrations. Fcap. 8vo, 5s. cloth.

Practical Philosophy.

A SYNOPSIS OF PRACTICAL PHILOSOPHY. By Rev. JOHN CARR, M.A., late Fellow of Trin. Coll., Camb. 18mo, 5s. cl.

Mollusca.

A MANUAL OF THE MOLLUSCA; being a Treatise on Recent and Fossil Shells. By Dr. S. P. WOODWARD, A.L.S. With Appendix by RALPH TATE, A.L.S., F.G.S. With numerous Plates and 300 Woodcuts. 3rd Edition. Cr. 8vo, 7s. 6d. cloth.

Clocks, Watches, and Bells.

RUDIMENTARY TREATISE ON CLOCKS, and WATCHES, and BELLS. By Sir EDMUND BECKETT, Bart. (late E. B. Denison), LL.D., Q.C., F.R.A.S. Sixth edition, revised and enlarged. Limp cloth (No. 67, Weale's Series), 4s. 6d.; cloth bds. 5s. 6d.

"As a popular and practical treatise it is unapproached."—*English Mechanic*.
 "The best work on the subject probably extant. The treatise on bells is undoubtedly the best in the language."—*Engineering*.
 "The only modern treatise on clock-making."—*Horological Journal*.

Grammar of Colouring.

A GRAMMAR OF COLOURING, applied to Decorative Painting and the Arts. By GEORGE FIELD. New edition, enlarged. By ELLIS A. DAVIDSON. With new Coloured Diagrams and Engravings. 12mo, 3s. 6d. cloth.

"The book is a most useful *résumé* of the properties of pigments."—*Builder*.

Pictures and Painters.

THE PICTURE AMATEUR'S HANDBOOK AND DICTIONARY OF PAINTERS: A Guide for Visitors to Picture Galleries, and for Art-Students, including methods of Painting, Cleaning, Re-Lining, and Restoring, Principal Schools of Painting, Copyists and Imitators. By PHILIPPE DARYL, B.A. Cr. 8vo, 3s. 6d. cl.

Woods and Marbles (Imitation of).

SCHOOL OF PAINTING FOR THE IMITATION OF WOODS AND MARBLES, as Taught and Practised by A. R. and P. VAN DER BURG, Directors of the Rotterdam Painting Institution. Illustrated with 24 full-size Coloured Plates; also 12 Plain Plates, comprising 154 Figures. Folio, 2l. 12s. 6d. bound.

Delamotte's Works on Illumination & Alphabets.

A PRIMER OF THE ART OF ILLUMINATION; for the use of Beginners: with a Rudimentary Treatise on the Art, Practical Directions for its Exercise, and numerous Examples taken from Illuminated MSS., printed in Gold and Colours. By F. DELAMOTTE. Small 4to, 9s. Elegantly bound, cloth antique.

"The examples of ancient MSS. recommended to the student, which, with much good sense, the author chooses from collections accessible to all, are selected with judgment and knowledge, as well as taste."—*Athenæum*.

ORNAMENTAL ALPHABETS, ANCIENT and MEDIÆVAL; from the Eighth Century, with Numerals; including Gothic, Church-Text, German, Italian, Arabesque, Initials, Monograms, Crosses, &c. Collected and engraved by F. DELAMOTTE, and printed in Colours. New and Cheaper Edition. Royal 8vo, oblong, 2s. 6d. ornamental boards.

"For those who insert enamelled sentences round gilded chalices, who blazon shop legends over shop-doors, who letter church walls with pithy sentences from the Decalogue, this book will be useful."—*Athenæum*.

EXAMPLES OF MODERN ALPHABETS, PLAIN and ORNAMENTAL; including German, Old English, Saxon, Italic, Perspective, Greek, Hebrew, Court Hand, Engrossing, Tuscan, Riband, Gothic, Rustic, and Arabesque, &c., &c. Collected and engraved by F. DELAMOTTE, and printed in Colours. New and Cheaper Edition. Royal 8vo, oblong, 2s. 6d. ornamental boards.

"There is comprised in it every possible shape into which the letters of the alphabet and numerals can be formed."—*Standard*.

MEDIÆVAL ALPHABETS AND INITIALS FOR ILLUMINATORS. By F. DELAMOTTE. Containing 21 Plates, and Illuminated Title, printed in Gold and Colours. With an Introduction by J. WILLIS BROOKS. Small 4to, 6s. cloth gilt.

THE EMBROIDERER'S BOOK OF DESIGN; containing Initials, Emblems, Cyphers, Monograms, Ornamental Borders, Ecclesiastical Devices, Mediæval and Modern Alphabets, and National Emblems. Collected and engraved by F. DELAMOTTE, and printed in Colours. Oblong royal 8vo, 1s. 6d. in ornamental boards.

Wood-Carving.

INSTRUCTIONS in WOOD-CARVING, for Amateurs; with Hints on Design. By A LADY. In emblematic wrapper, handsomely printed, with Ten large Plates, 2s. 6d.

"The handicraft of the wood-carver, so well as a book can impart it, may be learnt from 'A Lady's' publication."—*Athenæum*.

Popular Work on Painting.

PAINTING POPULARLY EXPLAINED; with Historical Sketches of the Progress of the Art. By THOMAS JOHN GULLICK, Painter, and JOHN TIMBS, F.S.A. Fourth Edition, revised and enlarged. With Frontispiece and Vignette. In small 8vo, 6s. cloth.

* * * This Work has been adopted as a Prize-book in the Schools of Art at South Kensington.

"Contains a large amount of original matter, agreeably conveyed."—*Builder*.

"Much may be learned, even by those who fancy they do not require to be taught, from the careful perusal of this unpretending but comprehensive treatise."—*Art Journal*.

AGRICULTURE, GARDENING, ETC.

Youatt and Burn's Complete Grazier.

THE COMPLETE GRAZIER, and FARMER'S and CATTLE-BREEDER'S ASSISTANT. A Compendium of Husbandry. By WILLIAM YOUATT, Esq., V.S. 12th Edition, very considerably enlarged, and brought up to the present requirements of agricultural practice. By ROBERT SCOTT BURN. One large 8vo. volume, 860 pp. with 244 Illustrations. 1*l*. 1*s*. half-bound.

"The standard and text-book, with the farmer and grazier."—*Farmer's Magazine*.

"A treatise which will remain a standard work on the subject as long as British agriculture endures."—*Mark Lane Express*.

History, Structure, and Diseases of Sheep.

SHEEP; THE HISTORY, STRUCTURE, ECONOMY, AND DISEASES OF. By W. C. SPOONER, M.R.V.C., &c. Fourth Edition, with fine engravings, including specimens of New and Improved Breeds. 366 pp., 4*s*. cloth.

Production of Meat.

MEAT PRODUCTION. A Manual for Producers, Distributors, and Consumers of Butchers' Meat. Being a treatise on means of increasing its Home Production. Also comprehensively treating of the Breeding, Rearing, Fattening, and Slaughtering of Meat-yielding Live Stock; Indications of the Quality; Means for Preserving, Curing, and Cooking of the Meat, etc. By JOHN EWART. Numerous Illustrations. Cr. 8vo, 5*s*. cloth.

"A compact and handy volume on the meat question, which deserves serious and thoughtful consideration at the present time."—*Meat and Provision Trades Review*.

Donaldson and Burn's Suburban Farming.

SUBURBAN FARMING. A Treatise on the Laying Out and Cultivation of Farms adapted to the produce of Milk, Butter and Cheese, Eggs, Poultry, and Pigs. By the late Professor JOHN DONALDSON. With considerable Additions, Illustrating the more Modern Practice, by R. SCOTT BURN. With Illustrations. Second Edition. 12mo, 4*s*. cloth boards.

Modern Farming.

OUTLINES OF MODERN FARMING. By R. SCOTT BURN. Soils, Manures, and Crops—Farming and Farming Economy—Cattle, Sheep, and Horses—Management of the Dairy, Pigs, and Poultry—Utilisation of Town Sewage, Irrigation, &c. New Edition. In 1 vol. 1250 pp., half-bound, profusely illustrated, 12*s*.

"There is sufficient stated within the limits of this treatise to prevent a farmer from going far wrong in any of his operations."—*Observer*.

Amateur Farming.

THE LESSONS OF MY FARM: a Book for Amateur Agriculturists, being an Introduction to Farm Practice, in the Culture of Crops, the Feeding of Cattle, Management of the Dairy, Poultry, Pigs, &c. By R. SCOTT BURN. With numerous Illus. Fcp. 6*s*. cl.

"A complete introduction to the whole round of farming practice."—*John Bull*.

The Management of Estates.

LANDED ESTATES MANAGEMENT: Treating of the Varieties of Lands, Methods of Farming, the Setting-out of Farms, Construction of Roads and Farm Buildings, of Waste or Un-productive Lands, Irrigation, Drainage, &c. By R. SCOTT BURN. Second Edition. 12mo, 3s. cloth.

"A complete and comprehensive outline of the duties appertaining to the management of landed estates."—*Journal of Forestry*.

The Management of Farms.

OUTLINES OF FARM MANAGEMENT, and the Organization of Farm Labour. Treating of the General Work of the Farm, Field, and Live Stock, Details of Contract Work, Specialties of Labour, Economical Management of the Farmhouse and Cottage, Domestic Animals, &c. By ROBERT SCOTT BURN. 12mo, 3s.

Management of Estates and Farms.

LANDED ESTATES AND FARM MANAGEMENT. By R. SCOTT BURN, Author of "Outlines of Modern Farming," Editor of "The Complete Grazier," &c. With Illustrations. Consisting of the above Two Works in One vol., 6s. half-bound.

English Agriculture.

THE FIELDS OF GREAT BRITAIN. A Text-book of Agriculture, adapted to the Syllabus of the Science and Art Department. For Elementary and Advanced Students. By HUGH CLEMENTS (Board of Trade). With an Introduction by H. KAINS-JACKSON. 18mo, 2s. 6d. cloth. [Just published.]

"A clearly written description of the ordinary routine of English farm-life."—*Land*.

"A carefully written text-book of Agriculture."—*Athenæum*.

"A most comprehensive volume, giving a mass of information."—*Agricultural Economist*.

Kitchen Gardening.

KITCHEN GARDENING MADE EASY. Showing how to prepare and lay out the ground, the best means of cultivating every known Vegetable and Herb, etc. By GEORGE M. F. GLENNY. 12mo, 2s. cloth boards.

Culture of Fruit Trees.

FRUIT TREES, the Scientific and Profitable Culture of. From the French of DU BREUIL, revised by GEO. GLENNY. 12mo, 4s.

Good Gardening.

A PLAIN GUIDE TO GOOD GARDENING; or, How to Grow Vegetables, Fruits, and Flowers. With Practical Notes on Soils, Manures, Seeds, Planting, Laying-out of Gardens and Grounds, &c. By S. WOOD. Third Edition. Cr. 8vo, 5s. cloth.

"A very good book, and one to be highly recommended as a practical guide. The practical directions are excellent."—*Athenæum*.

Gainful Gardening.

MULTUM-IN-PARVO GARDENING; or, How to make One Acre of Land produce £620 a year, by the Cultivation of Fruits and Vegetables; also, How to Grow Flowers in Three Glass Houses, so as to realise £176 per annum clear Profit. By SAMUEL WOOD. 3rd Edition, revised. Cr. 8vo, 2s. cloth.

"We are bound to recommend it as not only suited to the case of the amateur and gentleman's gardener, but to the market grower."—*Gardener's Magazine*.

Gardening for Ladies.

THE LADIES' MULTUM-IN-PARVO FLOWER GARDEN, and Amateur's Complete Guide. By SAMUEL WOOD. Author of "Good Gardening," &c. With Illustrations. Crown 8vo, 3s. 6d. cloth. [Just published.]

Bulb Culture.

THE BULB GARDEN, or, How to Cultivate Bulbous and Tuberous-rooted Flowering Plants to Perfection. A Manual adapted for both the Professional and Amateur Gardener. By SAMUEL WOOD, Author of "Good Gardening," etc. With Coloured Illustrations and Wood Engravings. Cr. 8vo, 3s. 6d. cloth.

Tree Planting.

THE TREE PLANTER AND PLANT PROPAGATOR: Being a Practical Manual on the Propagation of Forest Trees, Fruit Trees, Flowering Shrubs, Flowering Plants, Pot Herbs, &c. Numerous Illustrations. By SAMUEL WOOD. 12mo, 2s. 6d. cloth.

Tree Pruning.

THE TREE PRUNER: Being a Practical Manual on the Pruning of Fruit Trees. Including also their Training and Renovation, also treating of the Pruning of Shrubs, Climbers, and Flowering Plants. By SAMUEL WOOD. 12mo, 2s. 6d. cloth.

Tree Planting, Pruning, & Plant Propagation.

THE TREE PLANTER, PROPAGATOR, AND PRUNER. By SAMUEL WOOD, Author of "Good Gardening," &c. Consisting of the above Two Works in One Vol., 5s. half-bound.

Potato Culture.

POTATOES, HOW TO GROW AND SHOW THEM: A Practical Guide to the Cultivation and General Treatment of the Potato. By JAMES PINK. With Illustrations. Cr. 8vo, 2s. cl.

Hudson's Tables for Land Valuers.

THE LAND VALUER'S BEST ASSISTANT: being Tables, on a very much improved Plan, for Calculating the Value of Estates. With Tables for reducing Scotch, Irish, and Provincial Customary Acres to Statute Measure, &c. By R. HUDSON, C.E. New Edition, royal 32mo, leather, gilt edges, elastic band, 4s.

Ewart's Land Improver's Pocket-Book.

THE LAND IMPROVER'S POCKET-BOOK OF FORMULÆ, TABLES, and MEMORANDA, required in any Computation relating to the Permanent Improvement of Landed Property. By JOHN EWART, Land Surveyor and Agricultural Engineer. Royal 32mo, oblong, leather, gilt edges, with elastic band, 4s.

Complete Agricultural Surveyor's Pocket-Book.

THE LAND VALUER'S AND LAND IMPROVER'S COMPLETE POCKET-BOOK; consisting of the above two works bound together, leather, gilt edges, with strap, 7s. 6d.

"We consider Hudson's book to be the best ready-reckoner on matters relating to the valuation of land and crops we have ever seen, and its combination with Mr. Ewart's work greatly enhances the value and usefulness of the latter-mentioned. It is most useful as a manual for reference."—*North of England Farmer.*

'A Complete Epitome of the Laws of this Country.'

EVERY MAN'S OWN LAWYER; a Handy-Book of the Principles of Law and Equity. By A BARRISTER. New Edition, much enlarged. Corrected to the end of last Session. With Notes and References to the Authorities. Crown 8vo, cloth, price, 6s. 8d. (saved at every consultation).

COMPRISING THE RIGHTS AND WRONGS OF INDIVIDUALS, MERCANTILE AND COMMERCIAL LAW, CRIMINAL LAW, PARISH LAW, COUNTY COURT LAW, GAME AND FISHERY LAWS, POOR MEN'S LAW, THE LAWS OF

BANKRUPTCY—BILLS OF EXCHANGE—CONTRACTS AND AGREEMENTS—COPYRIGHT—DOWER AND DIVORCE—ELECTIONS AND REGISTRATION—INSURANCE—LIBEL AND SLANDER—MORTGAGES—

SETTLEMENTS—STOCK EXCHANGE PRACTICE—TRADE MARKS AND PATENTS—TRESPASS, NUISANCES, ETC.—TRANSFER OF LAND, ETC.—WARRANTY—WILLS AND AGREEMENTS, ETC.

Also Law for Landlord and Tenant—Master and Servant—Workmen and Apprentices—Heirs, Devisees, and Legatees—Husband and Wife—Executors and Trustees—Guardian and Ward—Married Women and Infants—Partners and Agents—Lender and Borrower—Debtor and Creditor—Purchaser and Vendor—Companies and Associations

—Friendly Societies—Clergymen, Churchwardens—Medical Practitioners, &c.—Bankers—Farmers—Contractors—Stock and Share Brokers—Sportsmen and Gamekeepers—Farriers and Horse-Dealers—Auctioneers, House-Agents—Innkeepers, &c.—Pawnbrokers—Surveyors—Railways and Carriers, &c., &c.

"No Englishman ought to be without this book."—*Engineer*.

"What it professes to be—a complete epitome of the laws of this country, thoroughly intelligible to non-professional readers. The book is a handy one to have in readiness when some knotty point requires ready solution."—*Bell's Life*.

"A useful and concise epitome of the law."—*Law Magazine*.

Auctioneer's Assistant.

THE APPRAISER, AUCTIONEER, BROKER, HOUSE AND ESTATE AGENT, AND VALUER'S POCKET ASSISTANT, for the Valuation for Purchase, Sale, or Renewal of Leases, Annuities, and Reversions, and of property generally; with Prices for Inventories, &c. By JOHN WHEELER, Valuer, &c.

Fourth Edition, enlarged, by C. NORRIS. Royal 32mo, cloth, 5s.

"A concise book of reference, containing a clearly-arranged list of prices for inventories, a practical guide to determine the value of furniture, &c."—*Standard*.

Auctioneering.

AUCTIONEERS, THEIR DUTIES AND LIABILITIES.

By ROBERT SQUIBBS, Auctioneer. Demy 8vo, 10s. 6d. cloth.

House Property.

HANDBOOK OF HOUSE PROPERTY: a Popular and Practical Guide to the Purchase, Mortgage, Tenancy, and Compulsory Sale of Houses and Land; including the Law of Dilapidations and Fixtures, &c. By E. L. TARBUCK. 2nd Edit. 12mo, 3s. 6d. cloth.

"We are glad to be able to recommend it."—*Builder*.

"The advice is thoroughly practical."—*Law Journal*.

Metropolitan Rating.

METROPOLITAN RATING: a Summary of the Appeals heard before the Court of General Assessment Sessions at Westminster, in the years 1871-80 inclusive. Containing a large mass of very valuable information with respect to the Rating of Railways, Gas and Waterworks, Tramways, Wharves, Public Houses, &c. By EDWARD and A. L. RYDE. 8vo, 12s. 6d. [Just published.]



A SELECTION FROM WEALE'S SERIES.

AGRICULTURE, GARDENING, &c.

THE TREE PLANTER AND PLANT PROPAGATOR:

a Practical Manual on the Propagation of Forest and Fruit Trees, Flowering Shrubs, and Plants, Pot-Herbs, &c. By SAMUEL WOOD. 2s.; cloth boards, 2s. 6d. [Just published.]

THE TREE PRUNER: a Practical Manual on the

Pruning of Fruit Trees, their Training and Renovation, with the best method of bringing old and worn-out trees into a state of bearing; and the pruning of shrubs, climbers, and flowering plants. By SAMUEL WOOD, Author of "Good Gardening," &c. 2s.; cloth boards, 2s. 6d. [Just published.]

THE TREE PLANTER, PROPAGATOR, AND

PRUNER. By S. WOOD. Consisting of the above two works in one handsome volume. Half-bound, 5s. [Just published.]

KITCHEN GARDENING MADE EASY. By

GEORGE M. F. GLENNY. 1s. 6d.; cloth boards, 2s.

SHEEP: THE HISTORY, STRUCTURE, ECO-

NOMY, AND DISEASES OF. By W. C. SPOONER, M.R.V.C., &c. Fourth Edition, enlarged. 3s. 6d.; cloth boards, 4s.

FRUIT TREES: The Scientific and Profitable Culture

of. From the French of DU BREUIL, revised by GEO. GLENNY. 187 Woodcuts. 3s. 6d.; cloth boards, 4s.

SOILS, MANURES, AND CROPS. (Vol. 1. OUTLINES

OF MODERN FARMING.) By R. SCOTT BURN. Woodcuts. 2s.

FARMING AND FARMING ECONOMY, Notes,

Historical and Practical, on. (Vol. 2. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. Woodcuts. 3s.

STOCK; CATTLE, SHEEP, AND HORSES. (Vol.

3. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. 2s. 6d.

DAIRY, PIGS, AND POULTRY, Management of the.

By R. SCOTT BURN. With Notes on the Diseases of Stock. (Vol. 4. OUTLINES OF MODERN FARMING.) Woodcuts. 2s.

UTILIZATION OF SEWAGE, IRRIGATION, AND

RECLAMATION OF WASTE LAND. (Vol. 5. OUTLINES OF MODERN FARMING.) By R. SCOTT BURN. Woodcuts. 2s. 6d.

OUTLINES OF MODERN FARMING. By ROBERT

SCOTT BURN. Being the above five books together in one vol., half-bound, 12s.

LANDED ESTATES MANAGEMENT. By R. SCOTT

BURN. 2s. 6d.; cloth boards, 3s. [Just published.]

FARM MANAGEMENT AND THE ORGANIZA-

TION OF FARM LABOUR. Treating of the General Work of the Farm, Field, and Live Stock, Contract Work, Economical Management of the Farmhouse and Cottage, &c. By R. SCOTT BURN. 2s. 6d.; cloth boards, 3s. [Just published.]

LANDED ESTATES AND FARM MANAGEMENT.

By R. SCOTT BURN. Consisting of the above two works in one handsome volume, half-bound, 6s. [Just published.]

CROSBY LOCKWOOD & CO., 7, STATIONERS' HALL COURT, E.C.

A SELECTION FROM WEALE'S SERIES.

MISCELLANEOUS VOLUMES.

A DICTIONARY OF TERMS used in ARCHITECTURE, BUILDING, ENGINEERING, MINING, METALLURGY, ARCHÆOLOGY, the FINE ARTS, &c. By JOHN WEALE. Fifth Edition. Revised by ROBERT HUNT, F.R.S., Keeper of Mining Records. 5s. cloth limp; 6s. cloth boards.

THE LAW OF CONTRACTS FOR WORKS AND SERVICES. By DAVID GIBBONS. Third Edition, revised and considerably enlarged. 3s.; cloth boards, 3s. 6d.

MANUAL OF DOMESTIC MEDICINE. By R. GOODING, B.A., M.D. Intended as a Family Guide in all Cases of Accident and Emergency. 2s.; cloth boards, 2s. 6d.

MANAGEMENT OF HEALTH. A Manual of Home and Personal Hygiene. By the Rev. JAMES BAIRD, B.A. 1s.

THE HOUSE MANAGER: being a Guide to House-keeping: Practical Cookery, Pickling and Preserving, Household Work, Dairy Management, the Table and Dessert, Cellarage of Wines, Home-brewing and Wine-making, the Boudoir and Dressing-room, Travelling, Stable Economy, Gardening Operations, &c. By AN OLD HOUSEKEEPER. 3s. 6d.; cloth boards, 4s.

HOUSE BOOK (The). Comprising:—I. *THE HOUSE MANAGER.* By AN OLD HOUSEKEEPER. II. *DOMESTIC MEDICINE.* By RALPH GOODING, M.D. III. *MANAGEMENT OF HEALTH.* By JAMES BAIRD. In One Vol., strongly half-bound. 6s.

FINE ARTS.

A GRAMMAR OF COLOURING, applied to Decorative Painting and the Arts. By GEORGE FIELD. New Edition, enlarged, and adapted to the Use of the Ornamental Painter and Designer. By ELLIS A. DAVIDSON. With Coloured Diagrams and numerous Engravings on Wood. 3s.; cloth boards, 3s. 6d.

PAINTING POPULARLY EXPLAINED, including Fresco, Oil, Mosaic, Water Colour, Water-Glass, Tempera, Encaustic, Miniature, Painting on Ivory, Vellum, Pottery, Enamel, Glass, &c. By T. J. GULLICK, assisted by J. TIMBS, F.S.A. Fourth Edition, enlarged. 5s.; cloth boards, 5s. 6d.

PERSPECTIVE FOR BEGINNERS: adapted to Young Students and Amateurs in Architecture, Painting, &c. By G. PYNE. Woodcuts. 2s.

GLASS STAINING; or, The Art of Painting on Glass, from the German of Dr. GESSERT. With an Appendix on THE ART OF ENAMELLING, &c.; together with *THE ART OF PAINTING ON GLASS,* from the German of EMANUEL OTTO FROMBERG. 2s. 6d.

MUSIC, A Rudimentary and Practical Treatise on. By C. C. SPENCER. 2s. 6d.

PIANOFORTE, The Art of Playing the; with numerous Exercises and Lessons. By C. C. SPENCER. 1s. 6d.

CROSBY LOCKWOOD & CO., 7, STATIONERS' HALL COURT, E.C.

